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E K I S T I C S

HOUSING & PLANNING ABSTRACTS

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Dymaxion map on cover by Buckminster Fuller, Patent 2393676

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EDITORIAL

This August number of Ekistics is devoted to the presentation of two projects for new towns, or their equivalent. One gives material on housing compiled by advanced architecture students, and the other shows a very full planning study by M.M. Roberto for Brasilia. Both contain many interesting features for others working in the field of housing and planning.

The first of this issue of Ekistics is given over to presenting a resumé of some of the work of the 'Master's Class' at the Harvard Graduate School of Design. The 1957-58 class of qualified architects working for their Master's Degree included men of ten different nationalities. For about half of the year they worked on a sequence of exercises culminating in designing very complete plans for the equivalent of two 'new towns' or 'residential sectors', for 35,000 and 60,000 respectively. One of these was situated within the already built-up city of Cambridge, Massachusetts, the other upon a virgin site on the fringe of the Boston metropolitan area. In both cases the students were attempting to develop the highest density of population conformable with the best living conditions they could devise. They worked for much of the time in close collaboration with a group of final year students from the Department of City Planning and the Department of Landscape Architecture, and undoubtedly much of the inspiration of their work came from the Dean of the Graduate School of Design, Jose Luis Sert. The students' projects grew from a study of individual house types, then the possible groupings of these and finally the application of these studies to an actual site, and M.M. Roberto's project grew from theoretical studies of city types down to the design of housing groups, but their results have much in common, and much that makes for interesting comparisons.

The second part of Ekistics is a very fully developed project for the new capital city of Brazil by M.M. Roberto. Of this Prof. Holford in an article, reproduced in Ekistics 30, said "I have never seen anywhere in the world a more comprehensive and thoroughgoing master-plan for a new capital city on a cleared site." Lucio Costa's prize-winning design for this city has been described in Ekistics 30 and a fairly harsh criticism of it was published in no. 31. Mr. Roberto's project is not published for comparison with this scheme, but in order to bring out certain special features of its own which seem to possess qualities of general interest.

All the schemes show an almost undiscussed acceptance of one of the most important developments of recent years: the grouping together of different house types. In other words the creation of 'differentiated settlements', or the complete acceptance of the fact that a human community consists of many kinds of people passing through different stages of their life's cycle - and therefore requiring different types of accomodation. Economic and aesthetic solutions of this undeniable social fact have been slow in appearing, and we still too often see large housing projects developed with but one or two house types.

All schemes also show a very careful separation of pedestrian from wheeled traffic, including the creation of pedestrian walks and plazas quite independent from the traffic streets and parking areas. This can probably also be accepted as one of the major steps forward now universally accepted as a contribution towards the humanization of our urban environment.

Many other points of similarity or contrast can be observed in these projects, which are in many ways indicative of world wide progressive ideas in the design of residential areas, but one other seems specially noticeable - the emphasis placed upon the location, grouping and design of buildings for community use. This again is characteristic of all the best contemporary community plans, no matter whether they are for Matabeleland or for Massachusetts.

EKISTICS is compiled by Yvette and Lawrence Mann under the direction of Prof. J. Tyrwhitt. Enquiries or comments should be addressed to 7 Sumner Road, Cambridge, Massachusetts, USA.

NOTE: The lettering at the top of each page refers to Doxiadis Associates system of classification. The figures below each title refer to the Universal Decimal Classification.

D.E.N.O.

Harvard University, Graduate School of Design.
MASTER'S CLASS HOUSING STUDY.
Cambridge, May 1958. 163 pages, illus.
728 (73)

1. The following illustrations are taken from a compilation of work produced by the Master in Architecture class at the Harvard Graduate School of Design, with the collaboration of students in landscape architecture and city planning, in a series of related studies dealing with the residential sector.

2. At the base of these studies is a recognition of the serious problems caused by the tremendous growth of cities, which spill over their traditional limits and combine to form vast urban regions.

3. The greatest physical force shaping this transformation is the greatly increased mobility of people and goods made possible by new mechanized means of transportation. The movement beyond the city's limits started in the nineteenth century with the railroads and developed along the rail lines. It was not until the wide use of the private automobile that the sprawl of cities in all directions began to take place.

4. This explosive thrust of the city into the countryside has created problems on both sides. On one hand, the central city is confronted with loss of population, revenue and leadership, as many of its most wealthy and able citizens move beyond its political borders. Commerce and industry, once firmly rooted in the cities, are likewise moving out along the highways. Thus many cities are unable to deal successfully with the problems of obsolescence and decay, leaving disorder and chaos at the cores.

5. On the other hand, the rural areas are receiving a tremendous upsurge of population which they are not prepared to receive. Towns grow without plan or measure, losing their old identities. Between them the open land is filling in with row upon row of houses. The natural beauty of vast areas of country is destroyed. It is replaced by modern suburban sprawl, which is characterised by shapelessness and lack of order and scale.

6. The study has undertaken to design two types of residential sectors -- one near the center of a large city, the other an area in the outskirts. These are more fully described on page 48. The introductory problem, lasting about eight weeks, the results of which are presented in the first part of the book, was for the purpose of developing measuring units to be used as a basis for designing the particular sectors in later stages of the study.

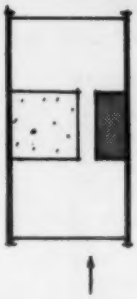
7. The first phase of the introductory problem was the selection and analysis of different residential types developed and used by other architects and planners. These were classified by types and analyzed for livability and efficiency.

8. The next phase consisted of the improvement of selected residential types by redesign or the proposal of new types. Emphasis was placed on livability and efficiency of cells together with economy of materials and construction and upon the combining of individual cells into groups or clusters.

Harvard University, GSD. Master's class housing study. -2

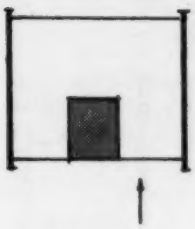
9. This phase was followed by a study of a grouping for 1000 people using one building type only, and finally by a grouping study using two or more building types and accomodating a total population of 5000.

,row house: basic types

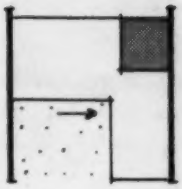


one story:

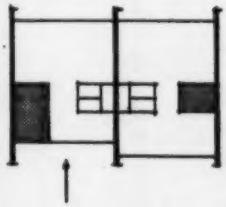
narrow lot, zoned living areas, concentrated core, privacy difficult



wide lot, little privacy, concentrated core

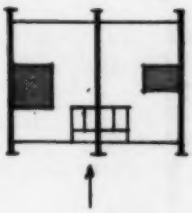


wide lot, large exposed area, entry difficult



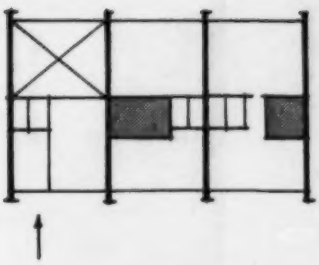
2 story:

narrow lot, economical, little privacy rear yard

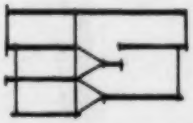


split level entry:

narrow lot, economical, good entry, little privacy rear yard



split level:



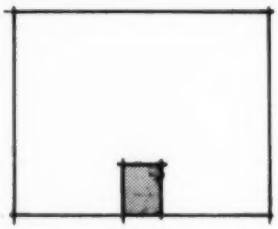
narrow lot, good spatial separation, little privacy rear yard

BOND DUBOIS SPRAGUE ZIMMER

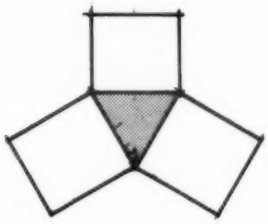
3 BR

• walk-up: basic types and location of circulation core

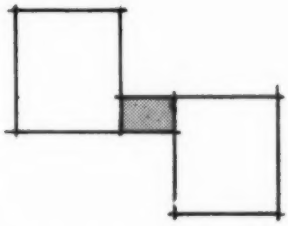
entry type



limited access and
orientation
economy of building

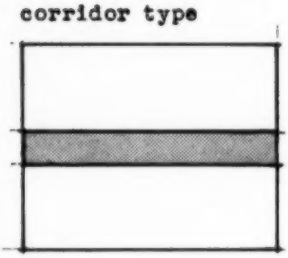


varying orientation
expensive structure
essentially one building

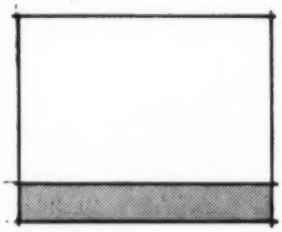


maximum units for entry
ease of combination

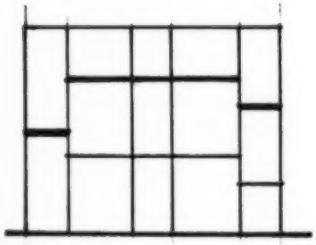
corridor type



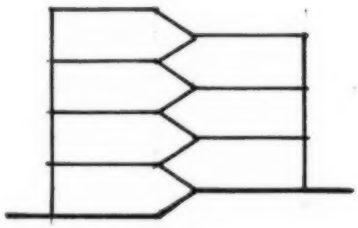
economy of construction
lack of cross ventilation



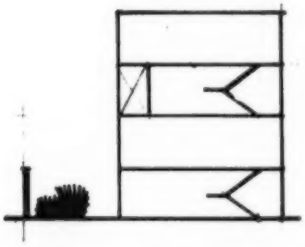
easy combination of units
through ventilation
good orientation



spiral level



split level

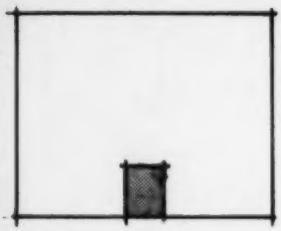


row house combination

0 1 2 4 6 8 10 12
3 BR

• walk-up: basic types and location of circulation core

entry type



limited access and
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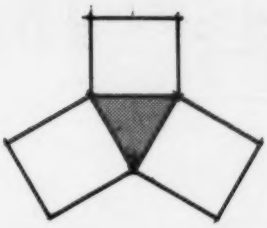
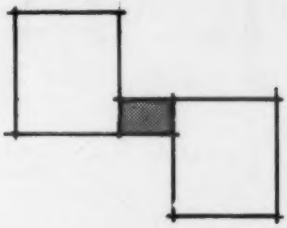
economy of building

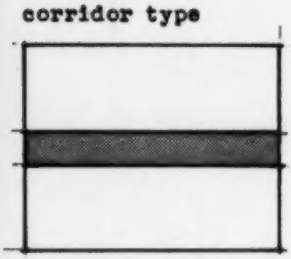


varying orientation
expensive structure
essentially one building



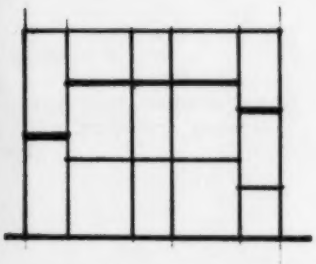
maximum units for entry
ease of combination

corridor type

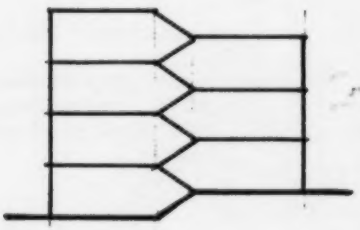


economy of construction
lack of cross ventilation

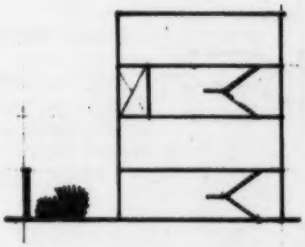
easy combination of units
through ventilation
good orientation



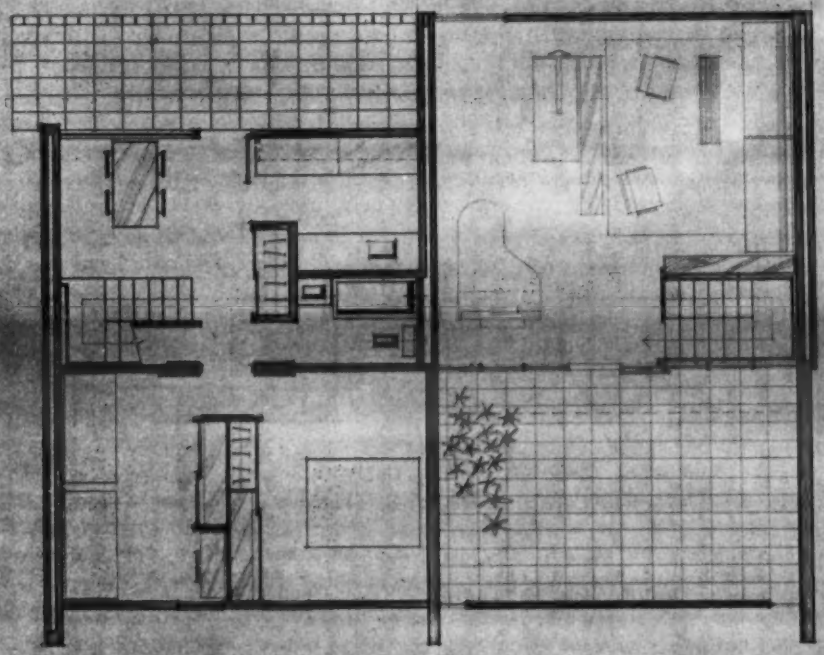
spiral level



split level



row house combination



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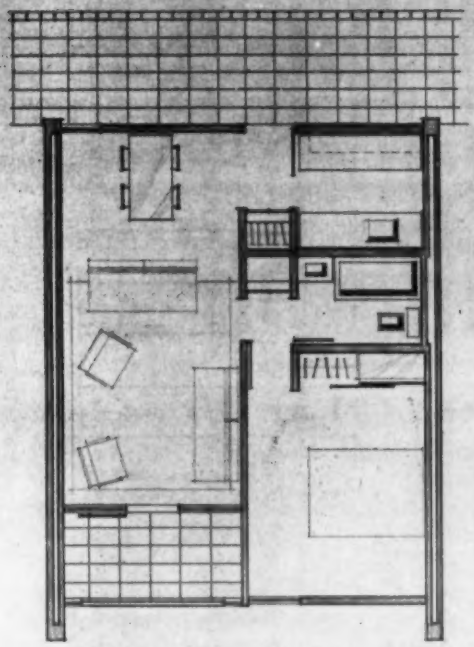
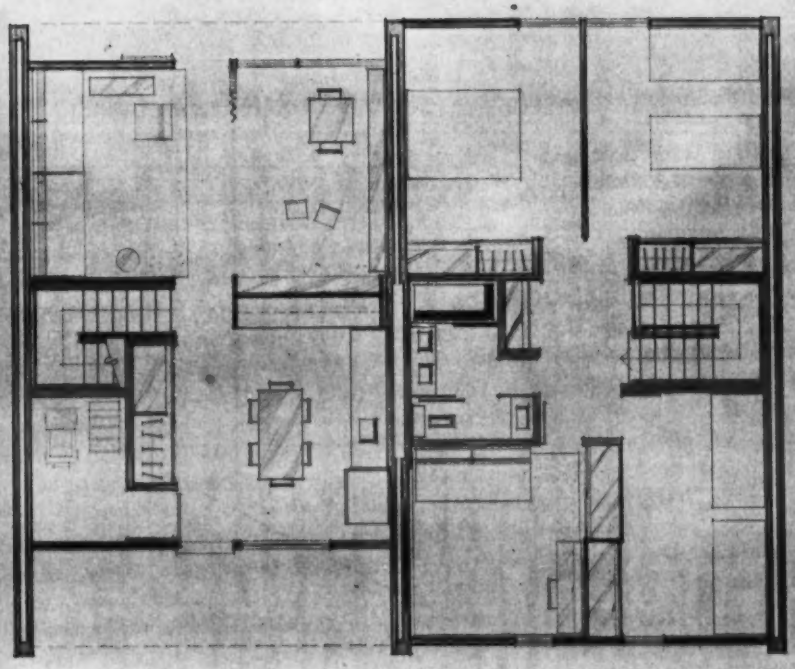
1 2



1 BR



4 BR

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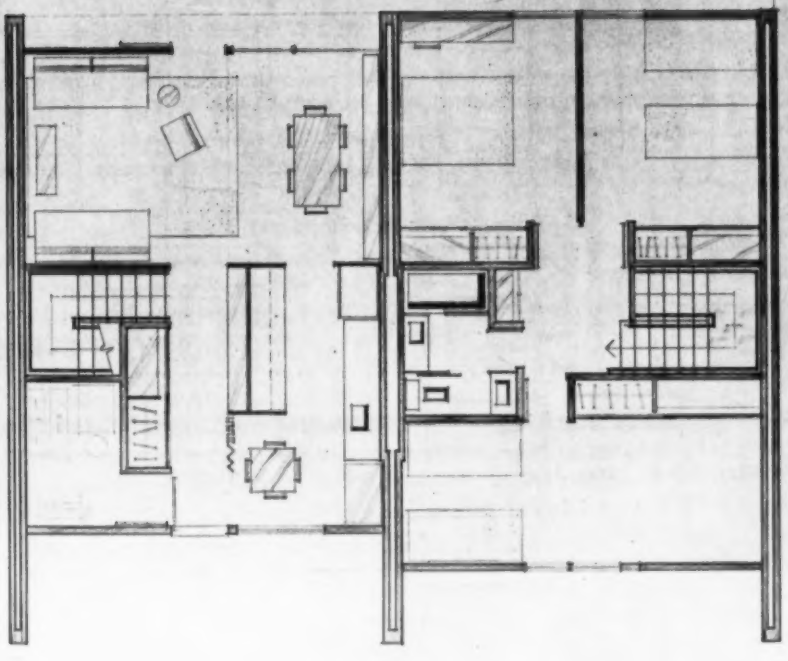
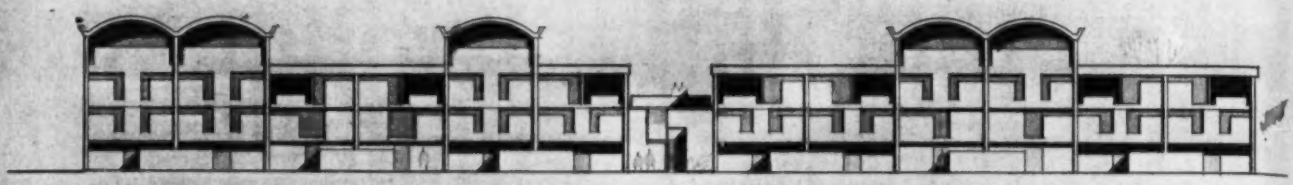


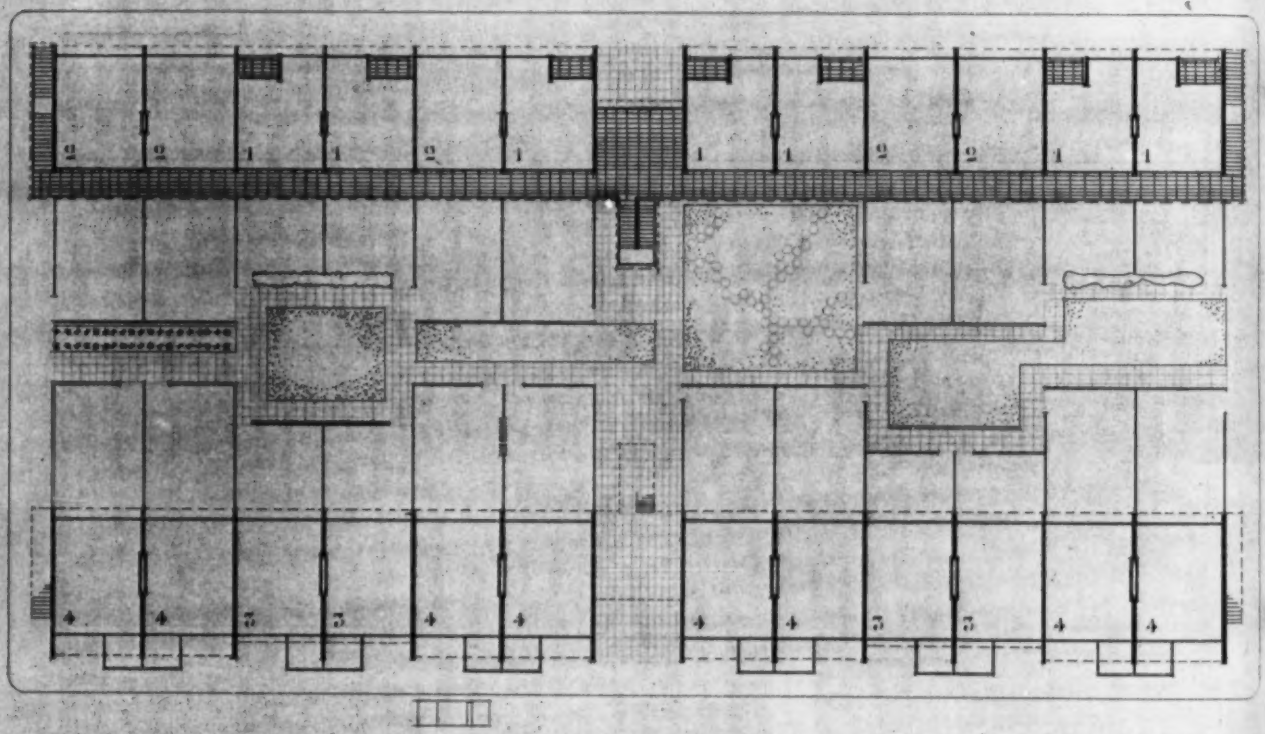
3 BR

1 2

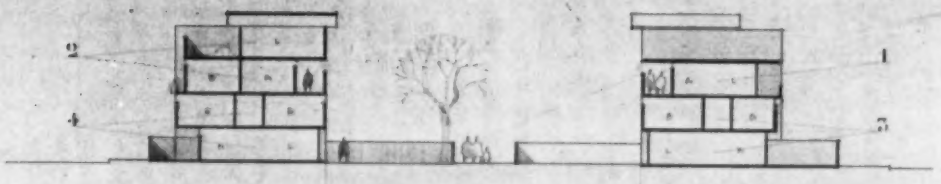


ELEVATION

GALLERY LEVEL PLAN

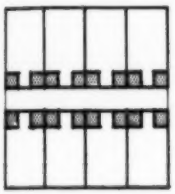


GROUND LEVEL PLAN

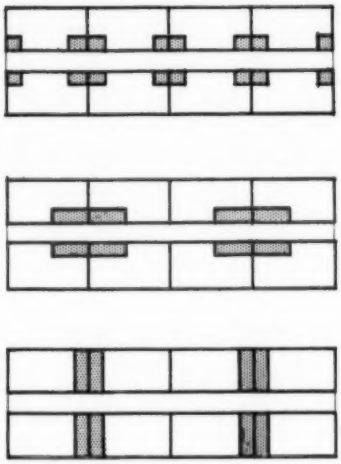


SECTION

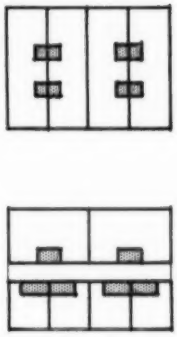
•interior corridor: basic disposition of units and core elements



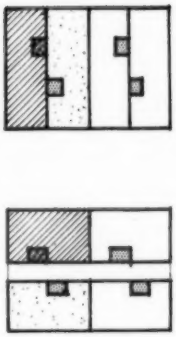
1. deep, narrow units
minimum corridor length, economical construction and maintenance, E-W orientation possible



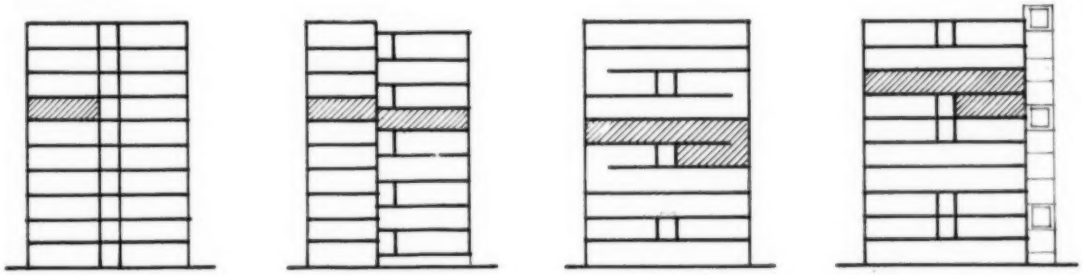
2. wide, shallow units
most flexible, maximum corridor and frontage, NE-SW best orientation



combination of 1 and 2 on alternate floors, through ventilation in alternate units



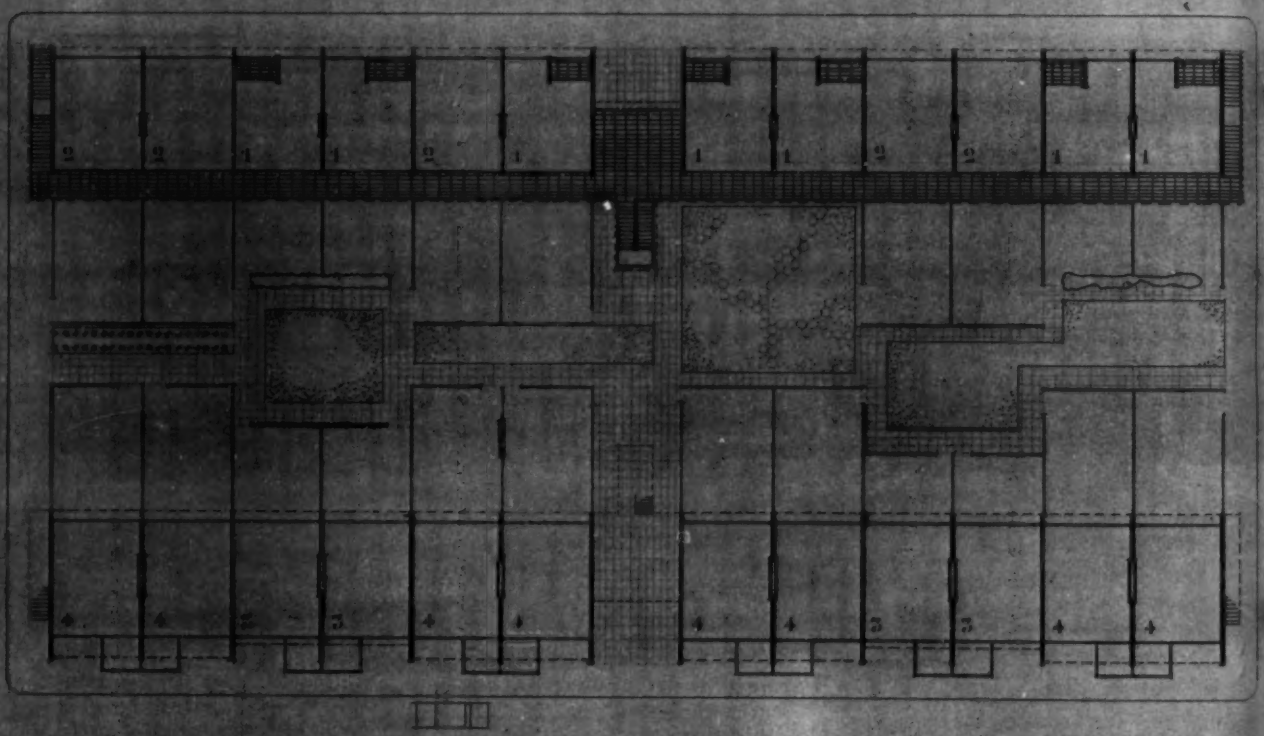
1 and 2 combined in one unit, units interlocked, through ventilation for all units



sections may be stacked, split, or interlocked and stacked to eliminate corridors, gain through ventilation, and create more interesting spaces

ELEVATION

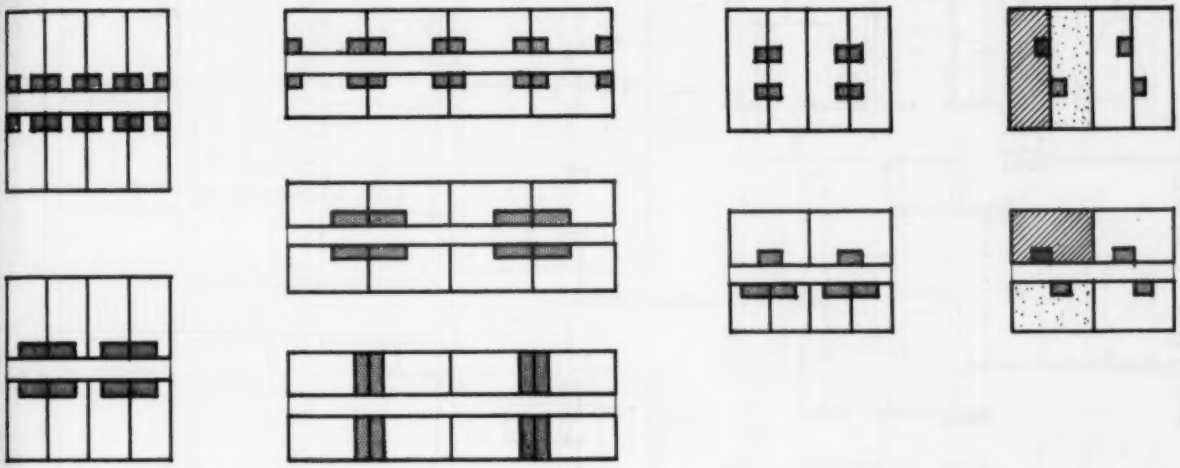
GALLERY LEVEL PLAN



GROUND LEVEL PLAN

SECTION

•interior corridor: basic disposition of units and core elements



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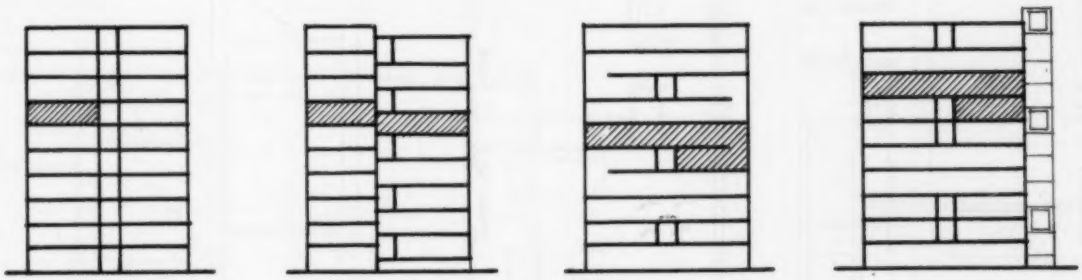

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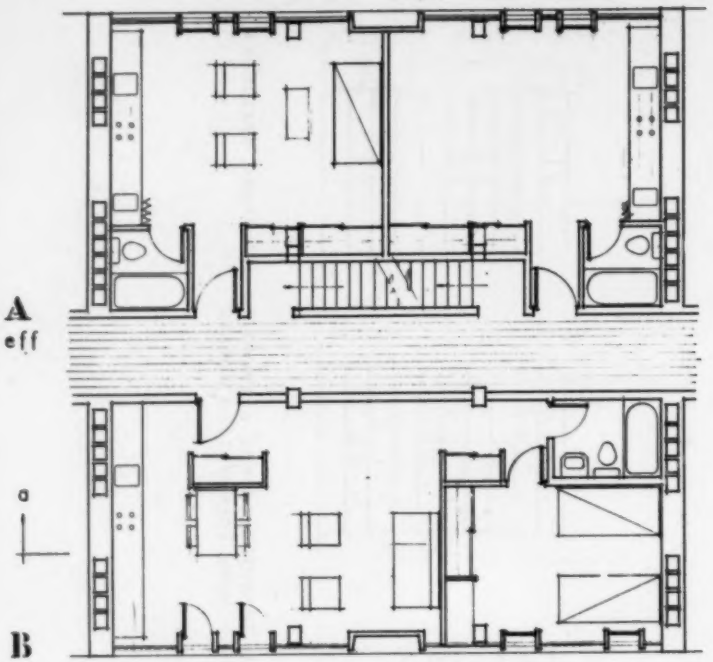
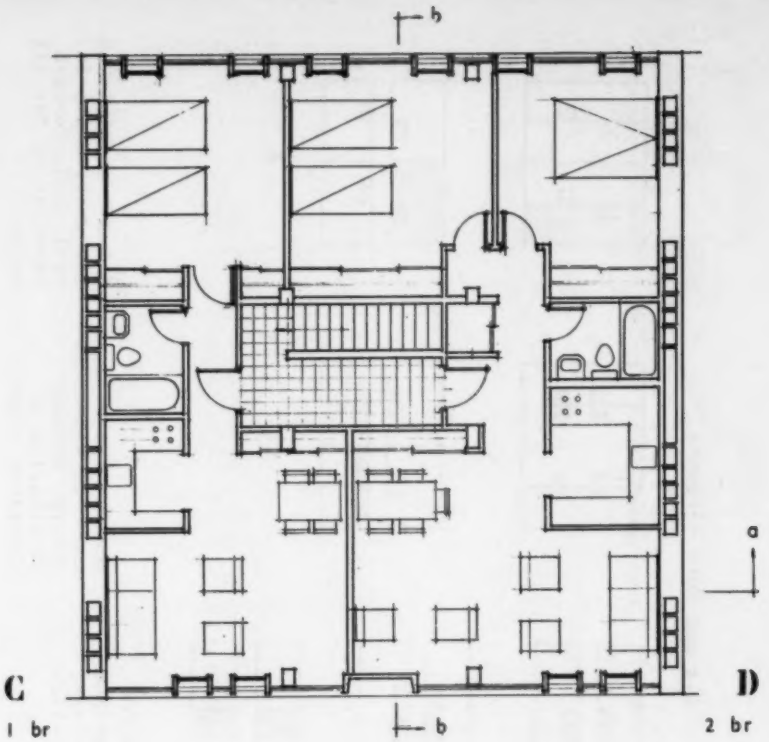
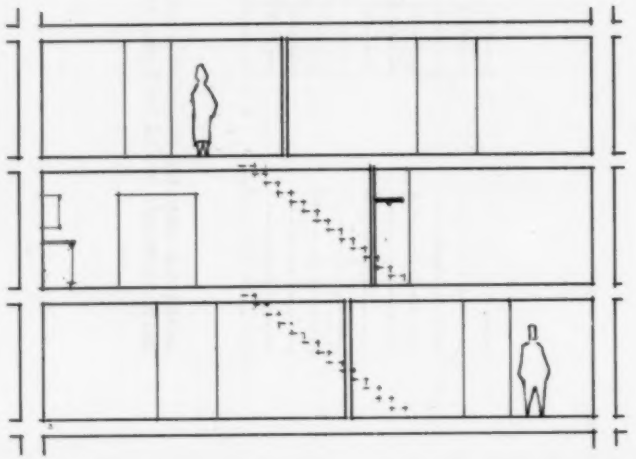
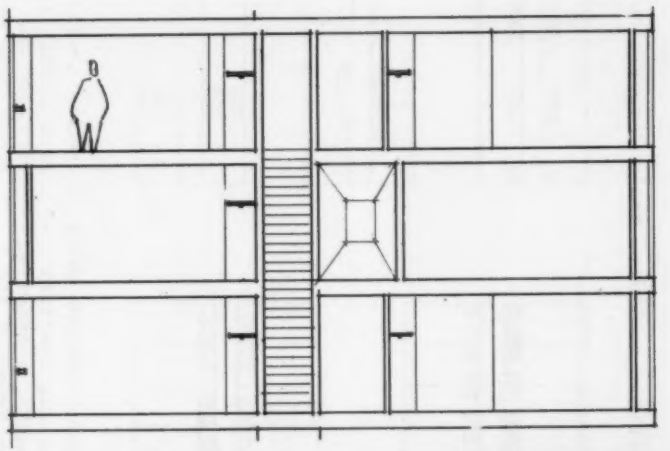








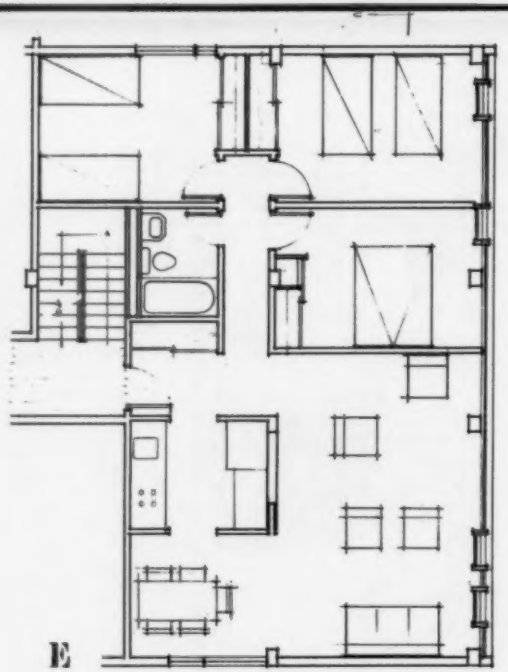
NOTTER

0 4 8 12

section a-a

section b-b

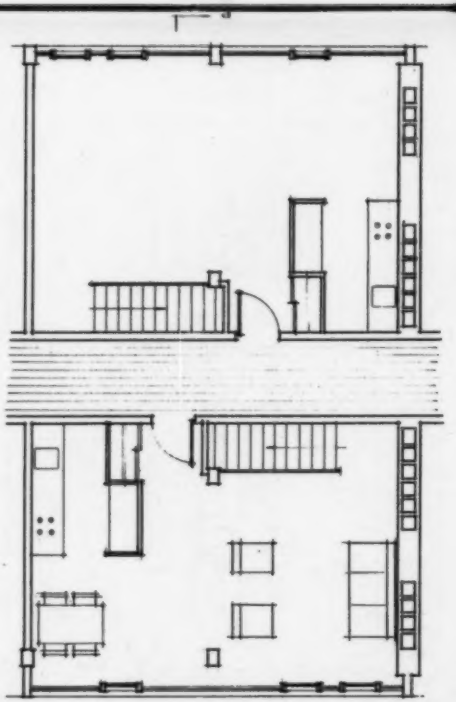
NOTTER



E

3 br

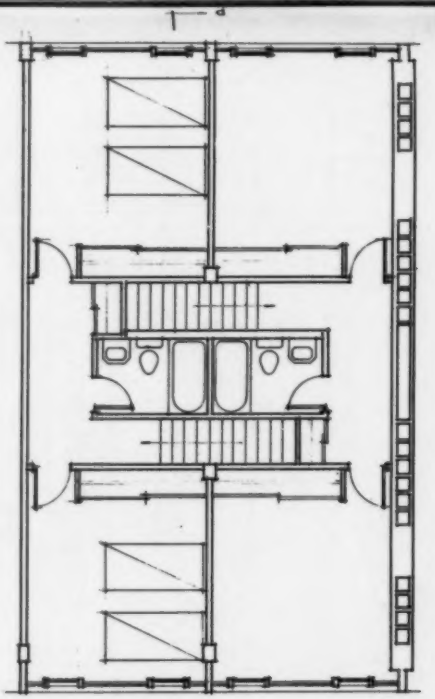
c



F

2 br duplex

d



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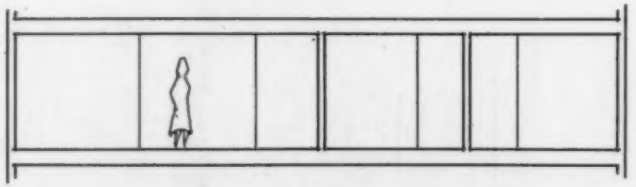

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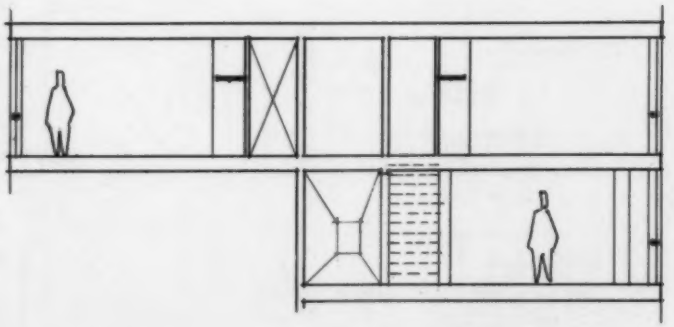

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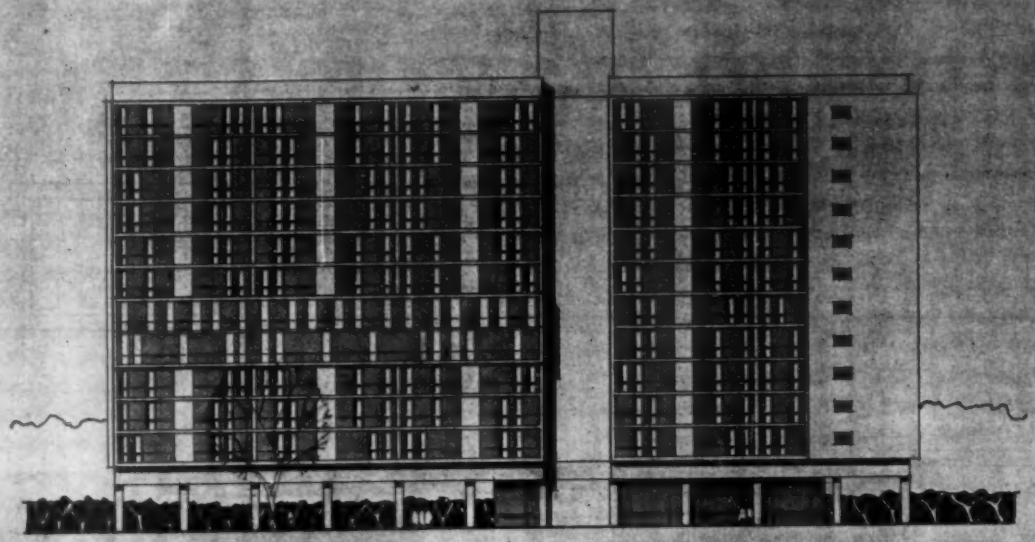
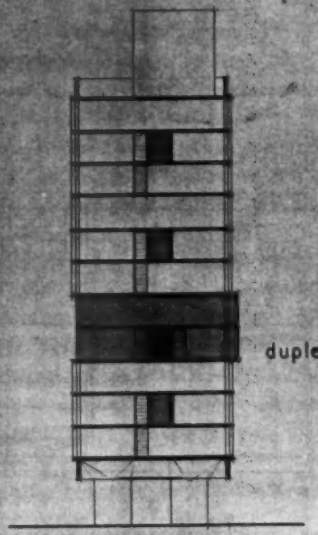
0 4 8 12

NOTTER

HIB-GA 35
Page 43



west elevation



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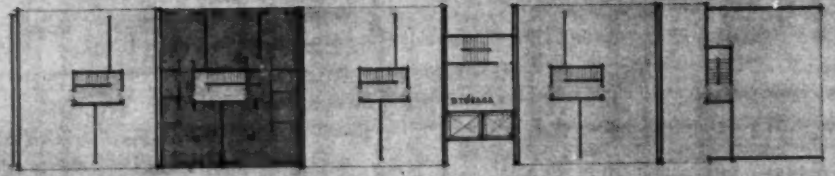
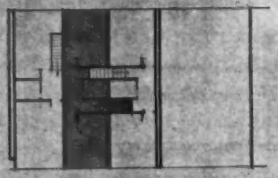
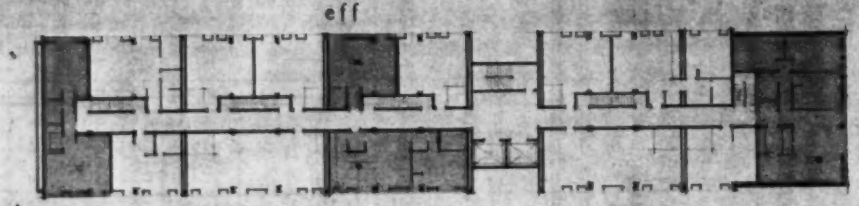
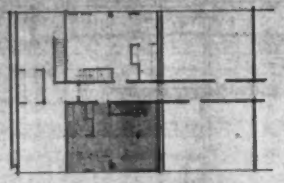


1 br 2 br

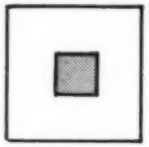




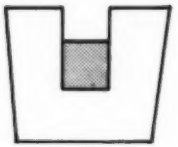


2 br duplex

basic core arrangements:



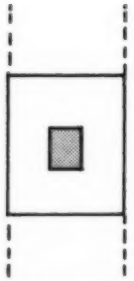
central core has no
connection to exterior
cross ventilation
all orientations possible



exterior core leaves 3
sides for favorable
orientation

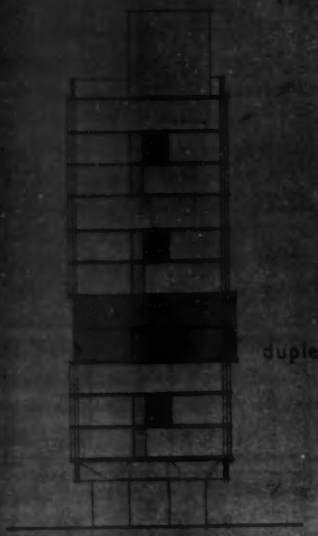
core accessible on 2 sides
from exterior
maximum ventilation

core at crossing point
of 3 or more wings
through ventilation

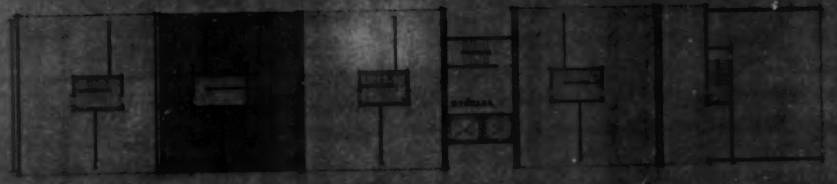


orientation limited to
2 sides
through ventilation
combination in slabs possible

west elevation



section

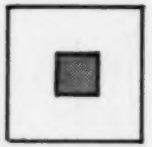


1 br 2 br

2 br duplex

NOTTER

basic core arrangements:

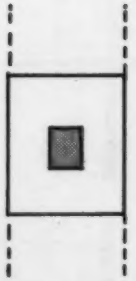


central core has no
connection to exterior
cross ventilation
all orientations possible

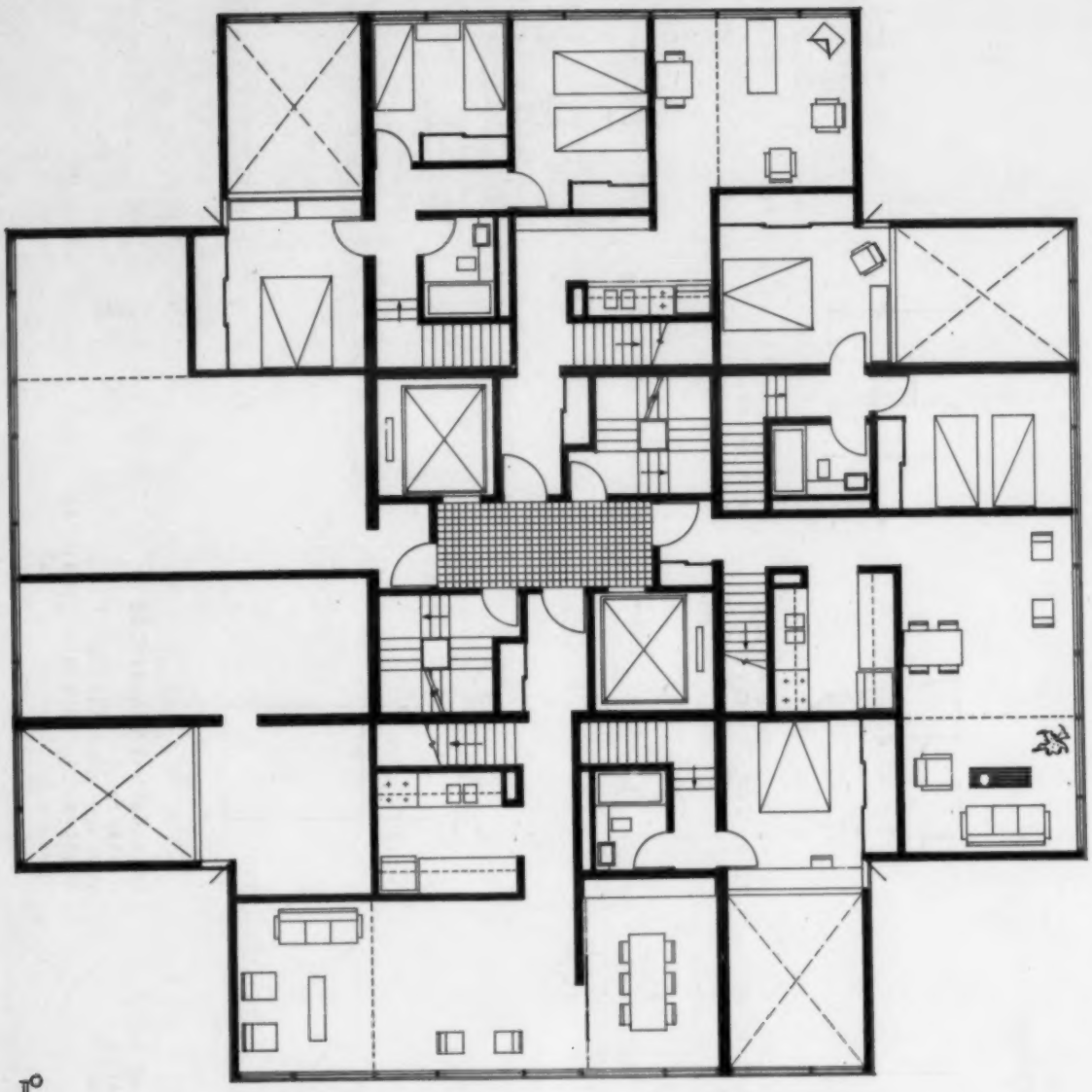
exterior core leaves 3
sides for favorable
orientation

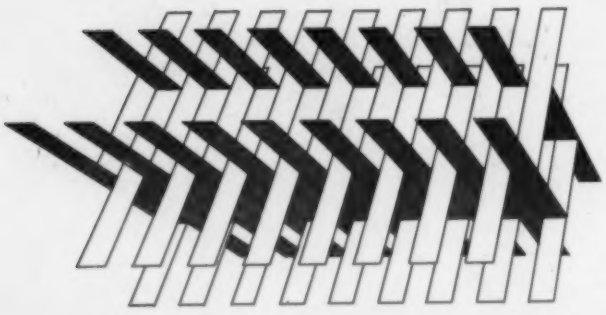
core accessible on 2 sides
from exterior
maximum ventilation

core at crossing point
of 3 or more wings
through ventilation

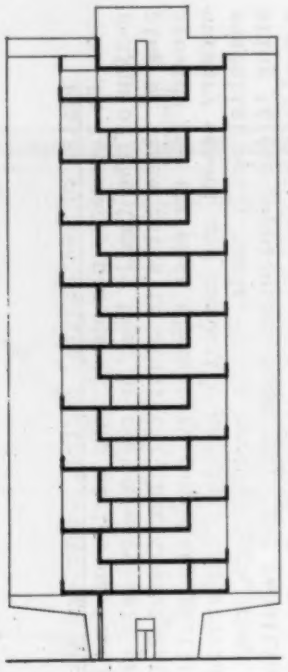


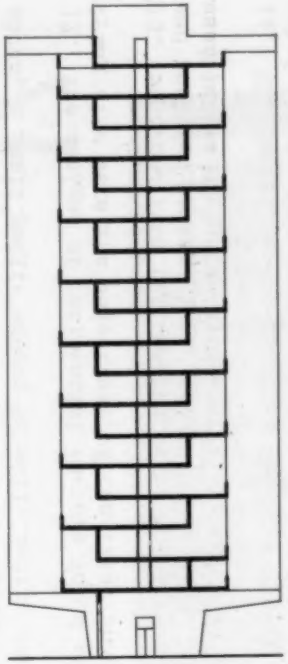
orientation limited to
2 sides
through ventilation
combination in slabs possible

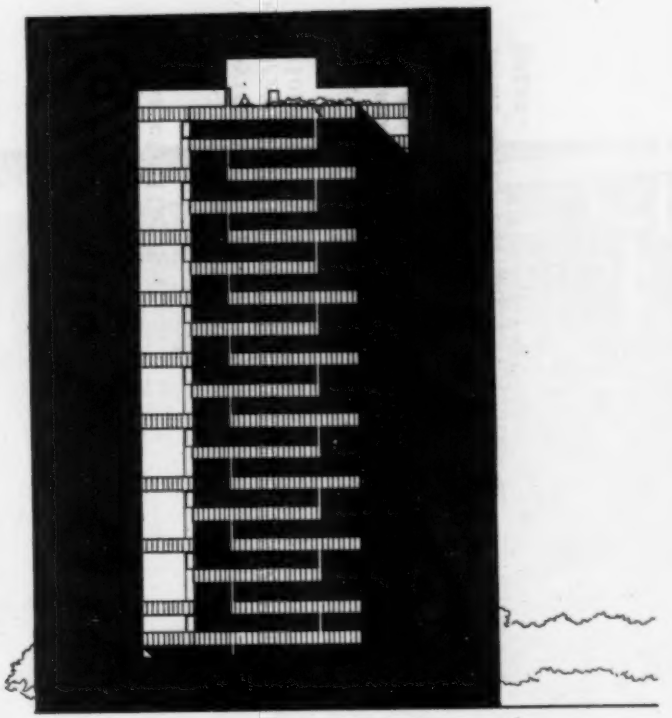




MORGAN 150







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16
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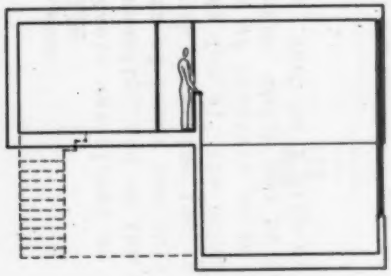

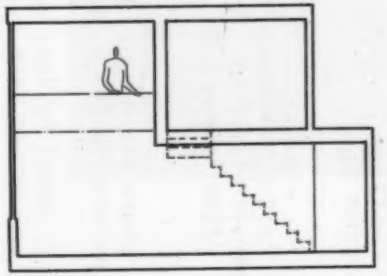

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4
20

Harvard University, GSD. Master's class housing study. -3

Design of residential sector, Cambridge and Billerica.

10. In the early phases of this series of studies, emphasis was placed on the design of the family home as the primary cell of the community, and on the grouping of these cells in clusters, But individual clusters of homes can only provide for the most elementary community facilities, such as a play lot, a nursery school and community parking. To provide and pay for all the other essential daily needs, it is necessary to group a number of clusters so as to bring larger populations together. The resulting community, which may be called a residential sector, is itself part of a bigger complex, such as a city or an urban region.

11. To fulfill its purpose, a residential sector should be large enough to be able to support the following services: a center of administration, a high school and several elementary schools, churches of different denominations, a good range of shops, movie house and other places of entertainment, normal medical and health facilities, some professional offices, service and repair shops, a small public square or mall, sports and other recreational facilities.

12. The designs of residential sectors for a central city site and for an outlying site were the objectives of the later phases of the housing study.

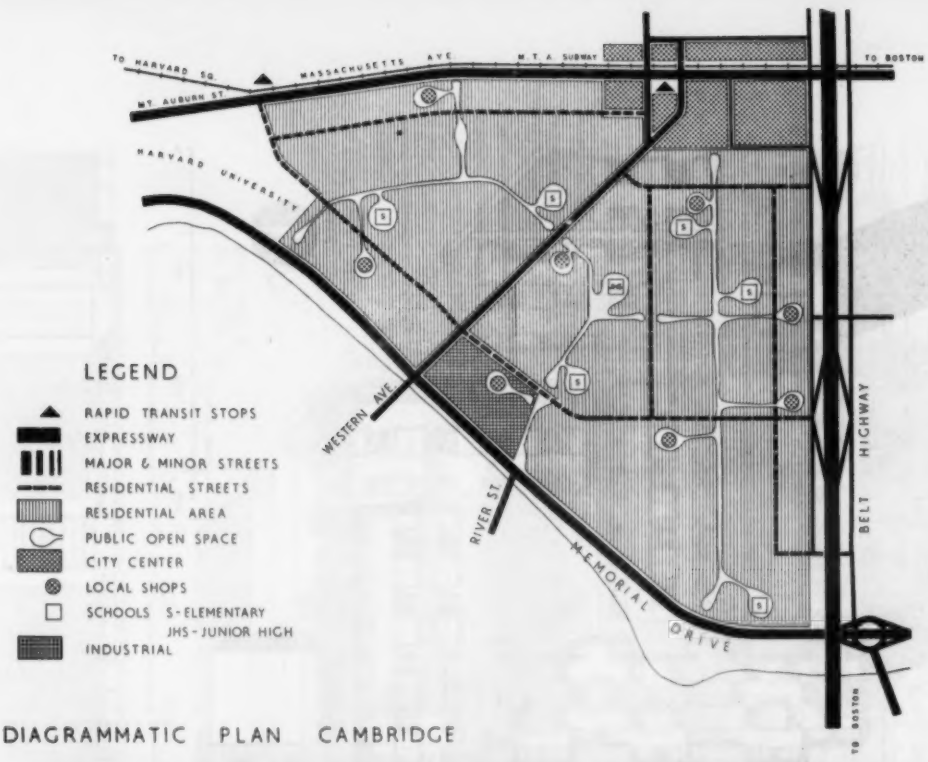
13. Students from the Department of the City and Regional Planning located and analyzed various sites for both projects. From these the actual areas used in the designing phases of the study were selected.

14. The Cambridgeport-Houghton areas of Cambridge, a section now actually scheduled for redevelopment, was the inlying site adopted. This area situated between Cambridge's two great educational institutions, Harvard and M.I.T., is of obvious importance in the future of this city and region.

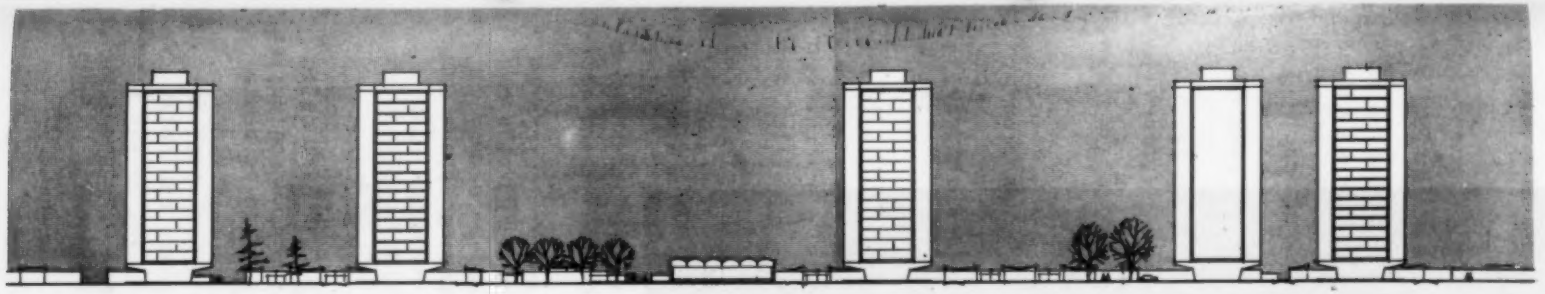
15. The outlying site is an ample area of rural land situated in the southwest portion of the town of Billerica. In addition to its favorable topographical features, it is strategically placed in relation to the arterial highway system and is contiguous on two sides to the Bay Circuit, the proposed reservation area circling Boston.

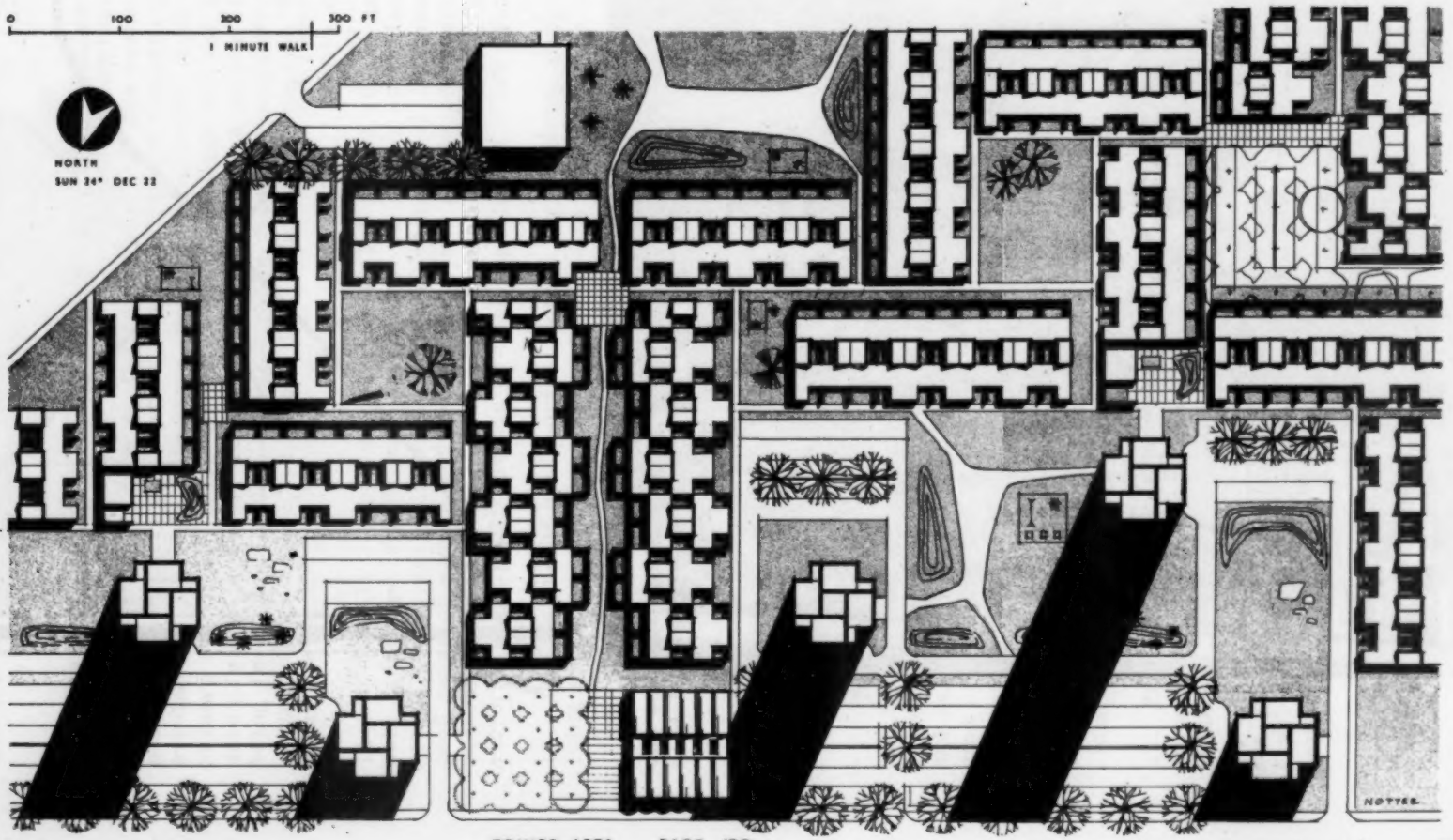
16. Two teams were organized to work on the central site and two for the outlying area. A team consisted generally of four architectural students, two city planners, and one landscape architect, working collaboratively. At the close of eight weeks of work four projects were produced, two for each site.

17. These schemes were studied and criticized by the jury. A single team was organized to work in each area, each team consisting of four architects, two landscape architects, and two or three city planners. As a result of the experience gained in the previous projects for each site and their critical analysis, one final plan for each area has been produced. The results of this final work, lasting and additional seven weeks, are presented on the following pages.



DIAGRAMMATIC PLAN CAMBRIDGE

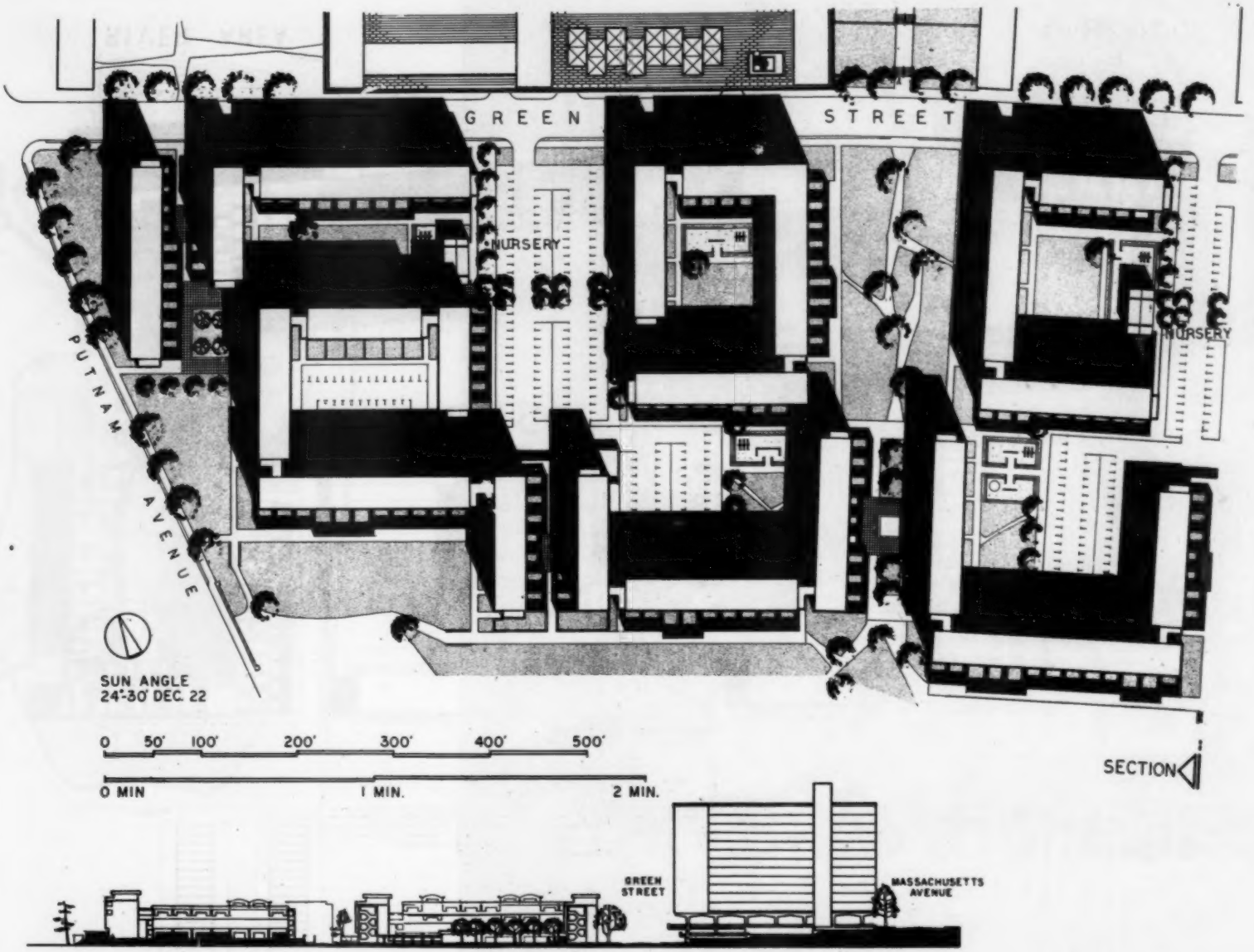




HIB-GA 35
Page 50

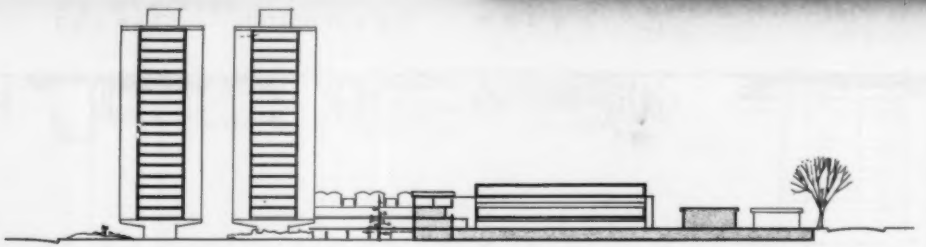
WEDGE AREA

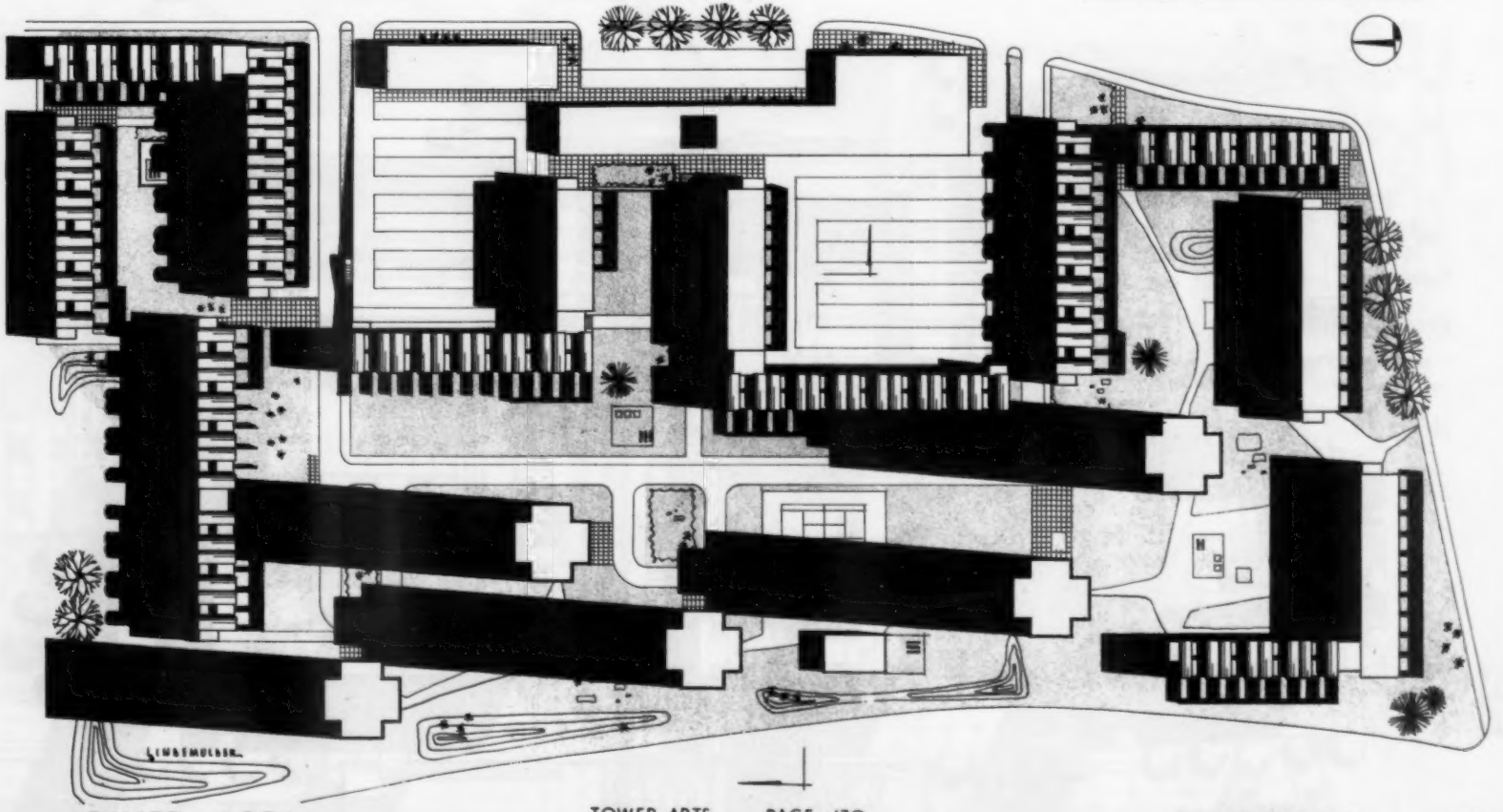
TOWER APTS PAGE 130
ROW HOUSE PAGE 57



DETAIL HOUGHTON AREA
G.A. MORLEDGE

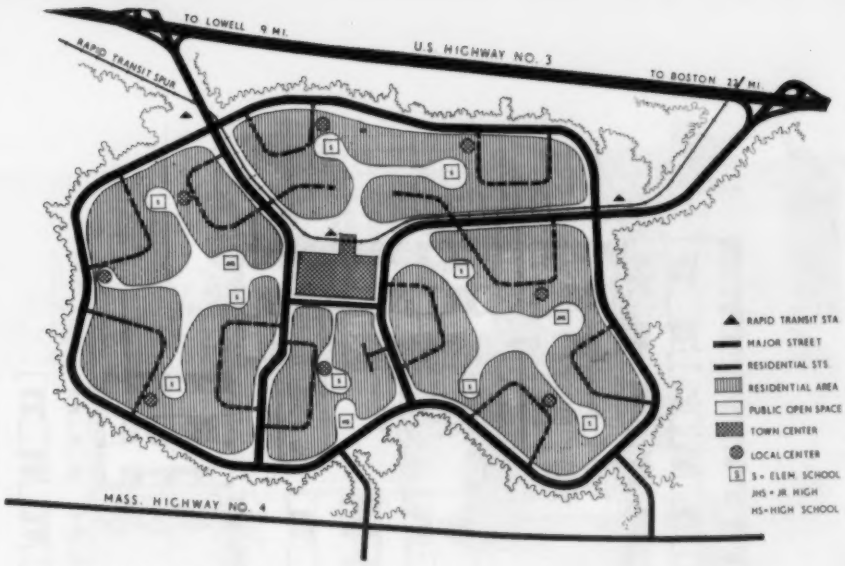
SLAB APTS PAGE 99
WALK UP APTS PAGE 75





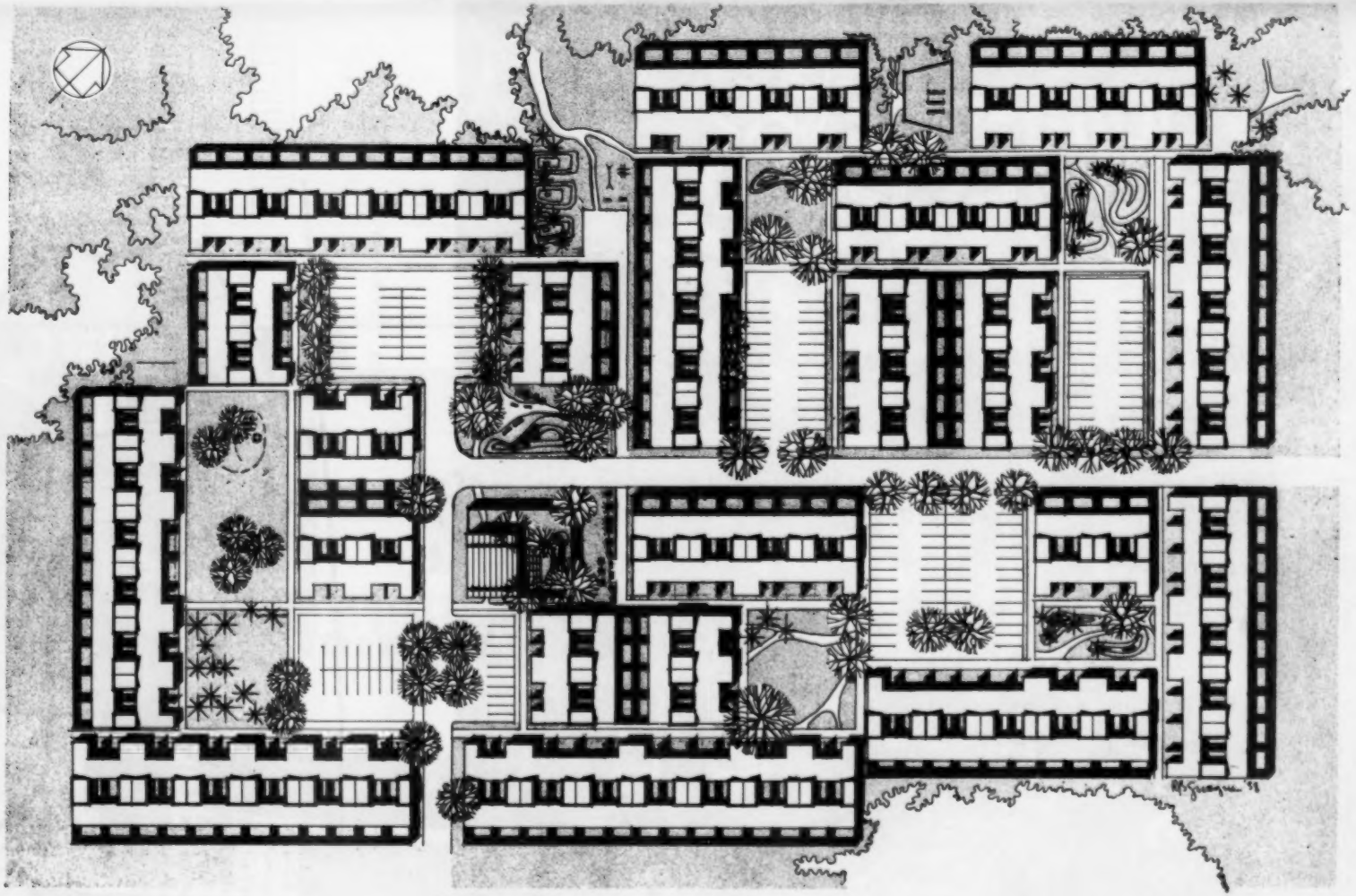
RIVER AREA

TOWER APTS PAGE 130
WALK UP APTS PAGE 75



DIAGRAMATIC PLAN

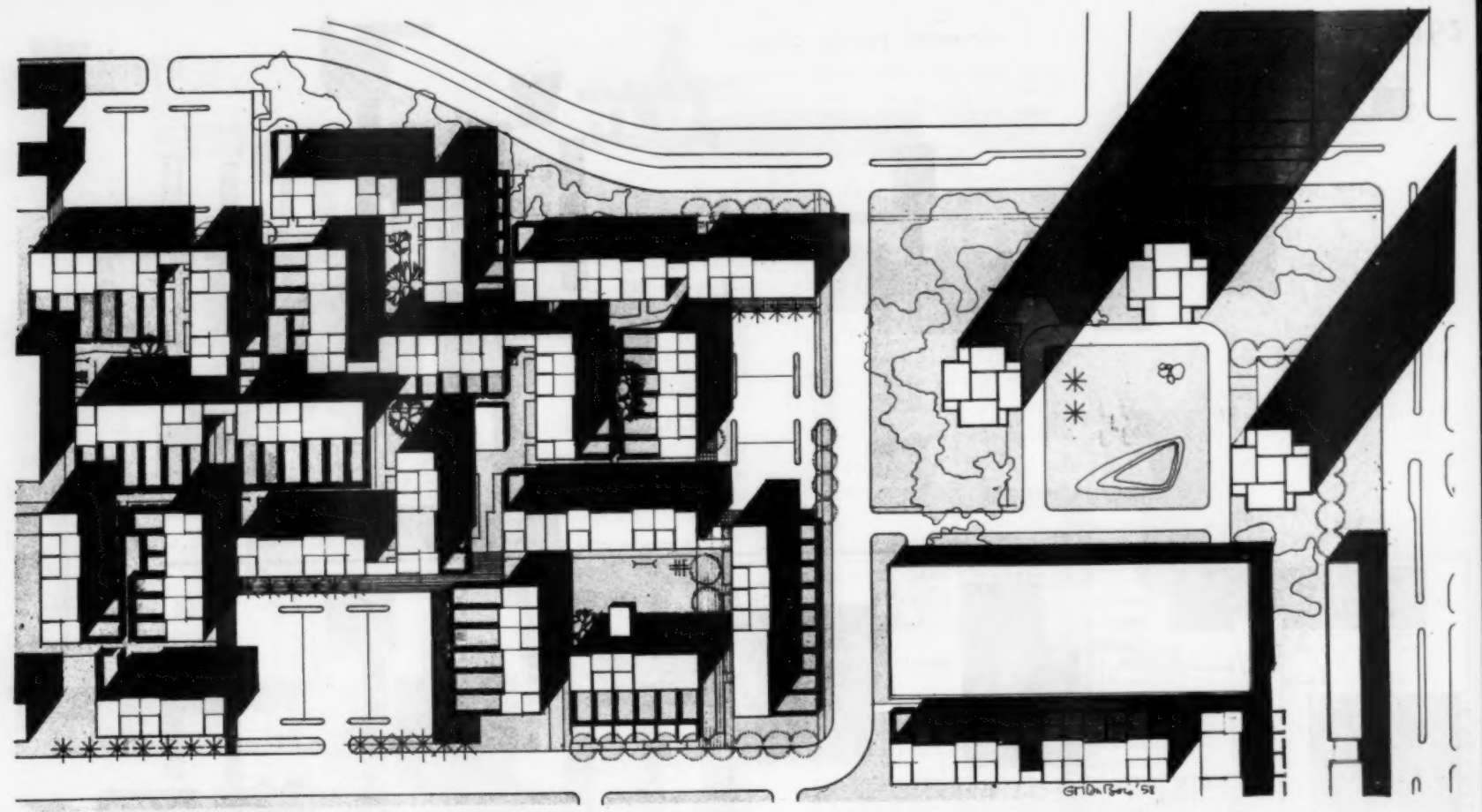
BILLERICA



TYPICAL ROW HOUSE GROUPING

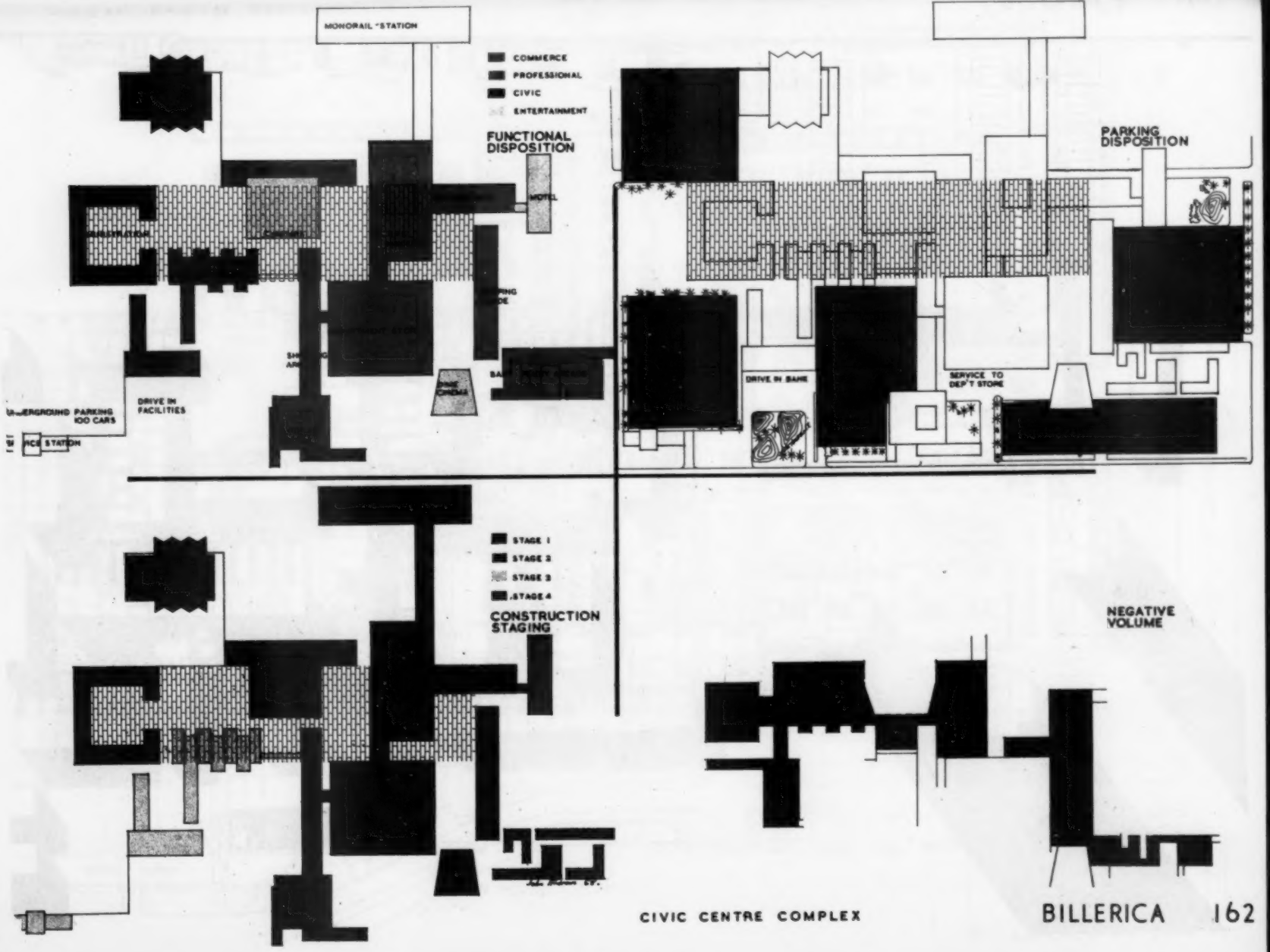
ROW HOUSE PAGE 57

0 100 200 300 FT.
1 MINUTE WALK



TYPICAL WALK-UP GROUPING

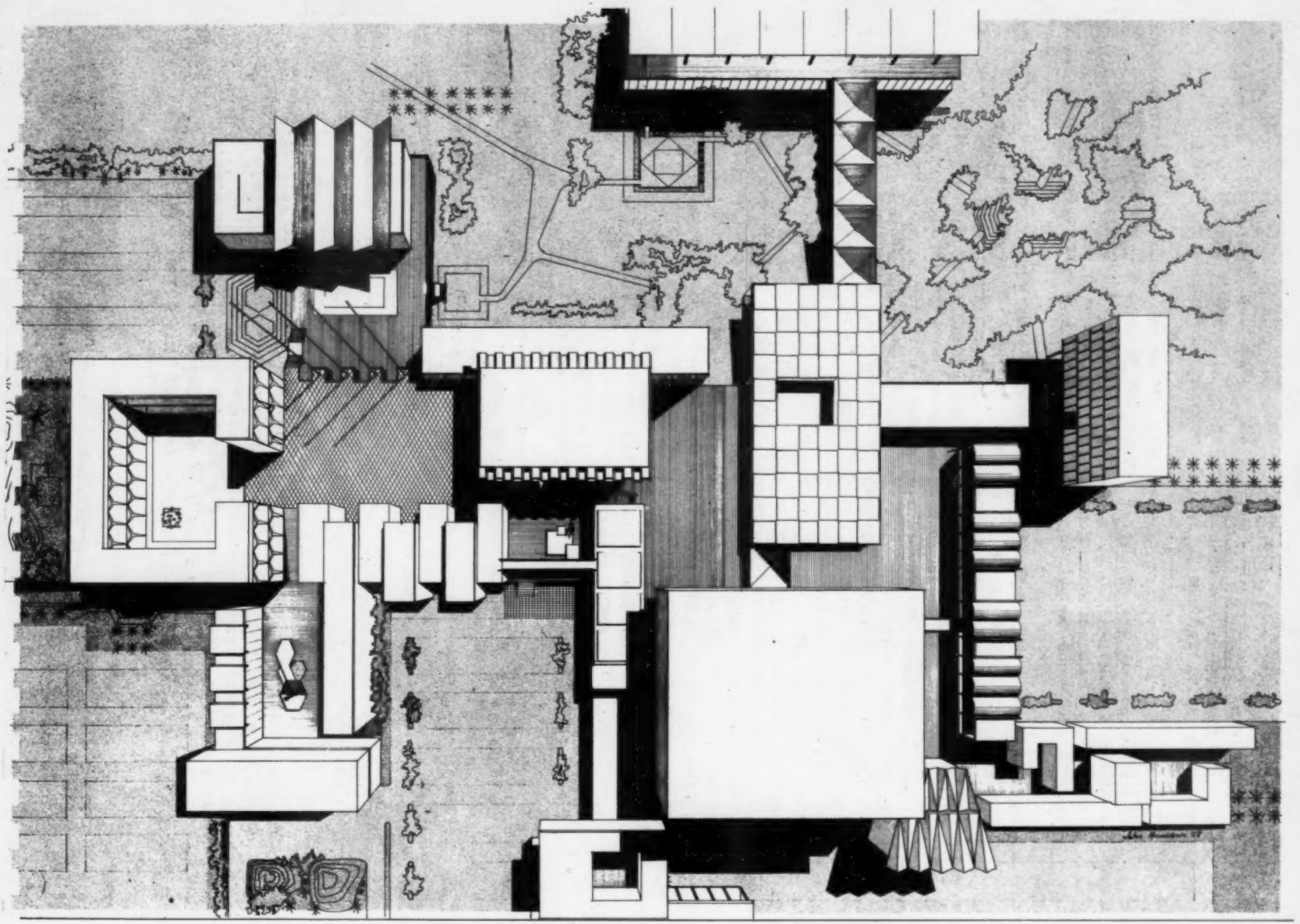
TOWER APT PAGE 130
WALK UP APT PAGE 75



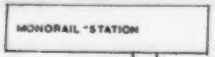
CIVIC CENTRE COMPLEX

BILLERICA 162

HTB-GA 35
Page 56



CIVIC CENTRE COMPLEX



C.D.I.J.M.O.

Roberto, M.M.
AN ALTERNATIVE PLAN FOR THE NEW CAPITAL CITY OF BRAZIL
drawings sent by M.M. Roberto, comments by J. Tyrwhitt.
711.432 (81)

1. To a large extent the following sequence of drawings speak for themselves. Mr. Roberto set about drawing up a plan for the new capital city of Brazil upon a site selected by the government after following through a sequence of thinking presented, very pleasantly if somewhat superficially, by the first 9 plates shown here. Readers are at liberty to agree or not with some of his assumptions, findings and statements about the prototype city patterns that he depicts. Many of them are, at least, debatable.

2. To some extent as a result of this exercise, Roberto decided to design a city composed of a number of completely segregated units, each housing one or two of the major government departments. His intention, undoubtedly, was to give as satisfying a life as possible to the families of the government workers, but his design is unfortunately based upon a major misunderstanding of the variety of occupational skills and ambitions within each family, as well as the needs for close co-operation between different government departments. Most families contain more than one bread-winner, and in very many cases the second wage-earner does not desire, or has not the special aptitudes, to follow the same occupation as the first (who may be his or her father, husband, brother, or almost any other relation). In Roberto's project this expression of individual preference becomes very difficult. There is a railway which connects all his separated units, but a criss-cross of journeys to work negates the very basis of his plan. He might well argue that, within each unit of some 75,000 people, there are necessarily a great variety of jobs within the normal 'services' required to support a population of this size. But, to a great extent, the very size of the individual units makes the weight of the special government offices, which form their center, even more oppressive. Every one of one's neighbours belongs to that same government department. This reproduces the worst social elements of the much decried and much studied single industry town or 'company town'. The second problem, of good communication between government departments themselves, can of course be met to some extent, as it is normally, by the use of telephones and of speedy travel by car. But it has to be noted that physical communication between the units has to pass through the pheripheral residential districts: also that all communication of the inhabitants of each unit with their unit center has to pass through the government office area. These fairly constant streams of 'through traffic' in areas intended as quiet zones seems another major fault in the design. The placing of the major government center - the capitol itself - on the edge of the lake, though certainly not in a central position, may well be justifiable on aesthetic grounds. But the absence of any focal element at the core of the whole project - the land adjacent to the central cross roads - seems strange.

3. The foregoing criticism, though it may not be identical with the views of the judges of this competition, gives an indication of some reasons why Roberto's very complete project did not gain the prize as a design for a new capital city. But, having said this, let us hasten to observe the very delightful way in which he has solved many of the details of his plan.

4. The plate showing one of the sectors of a typical residential unit (p. 72) displays at once the way in which Roberto has - very succesfully - tried to bring into harmony an area of independent single family houses with more

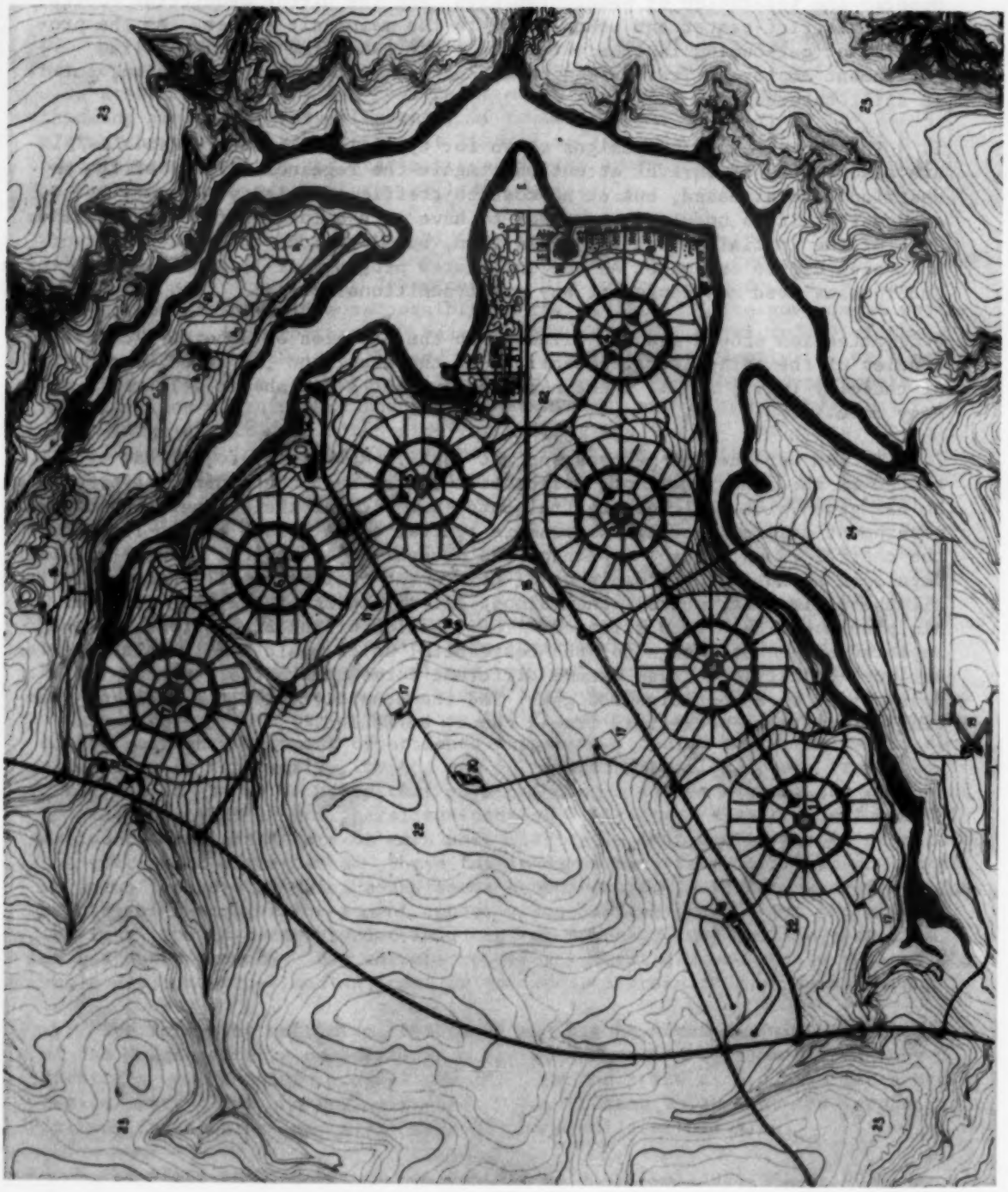
Roberto, M.M. An Alternative plan for the new capital city of Brazil. 2

densily developed areas of row housing, walk-ups and high rise apartments. Observe the separation of pedestrian ways, and the direct pedestrian routes to the district center and schools and to the main unit center. As the proportion of car-owning is likely to be low for some time among Brazilian government employees, car-parking does not accupy a dominant position, but it is still catered for.

5. The two alternative designs shown for typical unit centers (pp. 70-72) are also worthy of careful attention. Again the regained 'rights of the pedestrian' are stressed, but at no cost to traffic efficiency. It may be argued that it is unduly extravagant to have such a long traffic underpass as part of the initial design for a new town, but, provided the development of this area can be organized as one integrated program, it is probably that these underpasses need not represent any great additional costs.

6. Attention should also be directed to the examples of Roberto's careful studies of the agricultural potentials of the area, and the rates of growth of the city (pp. 77, 80-82). These examples are but a few sheets selected from many more.

7. To sum up, one can perhaps suggest that if Roberto's project had consisted of the same number of 'residential units' each containing the population he has given plus their own central core, but without their inner ring of government offices; and if two or more central areas - such as the land near the central cross roads and perhaps the present major capitol site, - had been developed as integrated complexes of government offices (easily accessible from all the residential units), then almost all criticism of the main lines of his plan would have been silenced. The question of the arbitariness of the repeated hexagonal design for the residential units would remain as a deterrent, but such geometric devices assume different forms when actually interpreted upon a site by a sensitive designer, and the sensitivity of the detailed planning within these over-rigid frames cannot be denied.

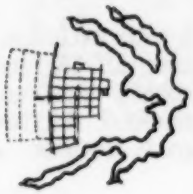


NC THE SOLUTION (METROPOLIS)

(1)

We could have followed a grid-iron plan, as in Miletus...

...or Chandigarh



(4)

The more efficient cities have between 50.000 and 100.000 inhabitants. The Capital of Brazil cannot be fitted inside these limits.
We decided, thus, to have a "Federation of Urban Units" (each Unit beeing a complete city, containing all needed services) following, in its general lines, the scheme proposed by Maurice-François Rouge in "Introduction à un Urbanisme Expérimentale".

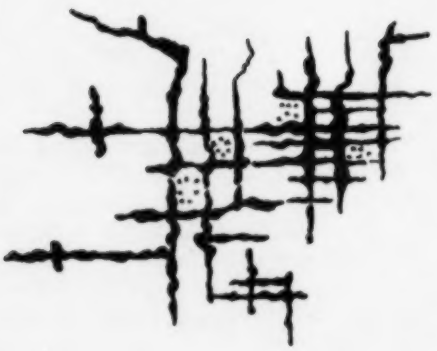
(2)

We would spread the superblocks in terraces, following the falling lines of the ground.

(3)

But...

A monocelular city of 500.000 inhabitants will have all the defects of 'Megalopolis (Lewis Mumford). Defects that will increase with time: if the city has reached 500.000 inhabitants, why shouldn't it reach 800.000, one million, ore more?



Contrôl will be almost impossible, real estate speculation will produce the unending suburbia, and before the plan is achieved, there will be the congestion, waste, and the confinement of the city dweller by the deadly traffic.

NC THE SOLUTION (METROPOLIS)

(5)

The lake (Paranoá River reservoir), should be more than an accessory to the landscape, or a sunday attraction

The privilege of living near the lake side should not be restricted to the Presidential Palace dwellers (1) or the guests of the Hotel now abuilding (2)

Therefore we abandoned the high ground and spread the Units around the western shore of the lake.

The small temperature and humidity differences are compensated by the proximity to the lake.

(6)

The highest level, where one can have a full 360° view, we have chosen for a regional sight-seeing center, where there will be installations for recreation and refreshment.

(7) One should be able to look into clear space; cities must have an openin towards the open country, if possible to the East, as was the wish o Aristotle But they should also have a limiting barrier, a mountain, a hill, wooded and not too far, to satisfy the ancestral need for security.

(8)

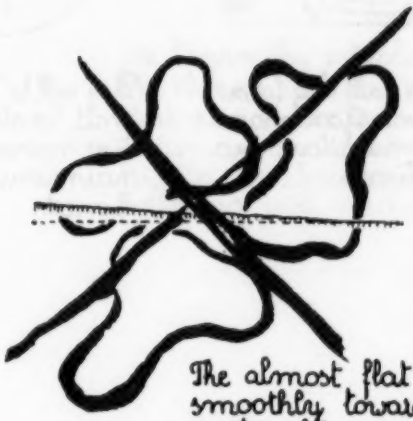
$(U_1)+(U_2)+(U_3)+(U_4)+(U_5)+(U_6)+(U_7)$ = METROPOLIS

There will be seven Urban Units. Added together they will be the Metropolis, in harmonious descentralization. With the exception of the buildings for the top echelons of the Federal Government that will be in a special area (the Federal Center) all the installations for work, play and services will be distributed among all the Units.

There will be no stars and no satelites; all the Units will be on the same level. And tomorrow, when new Units become indispensable, the same equilibrium can be maintained

NC THE SOLUTION (UNITS)

(1)

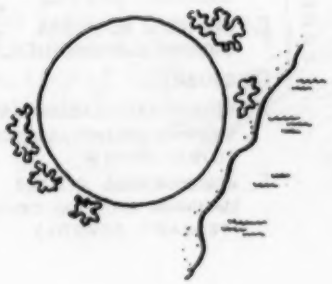


The almost flat terrain, just rolling smoothly towards the lake (5% maximum grade), let us avoid the everpresent ameboids. The design of the Units follow a strict discipline, within simple and logical lines...

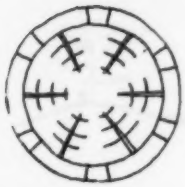
(2)

... Thus

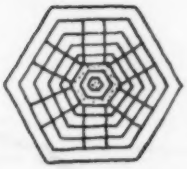
Our Units will be circular.
For centuries, once the Hippodamic concepts are abandoned, the diagrams of ideal cities are in circular patterns



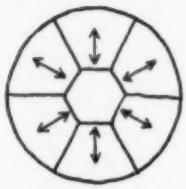
(3)



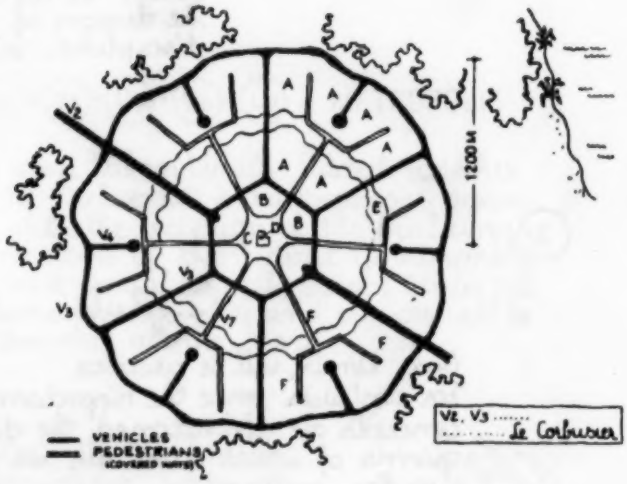
They will be circular, but not centrifugal, as A. Klein wished...



... nor will they follow Percival Goodmanns (Communitas) propositions.



They will be "centrifugal" and "centripetal" - the two movements harmoniously, combined.

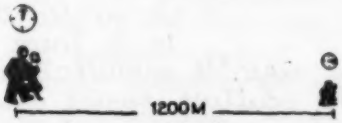


CORE
- A. DWELLINGS
- B. WORK, ADMINISTRATION, CULTURE, SERVICE
- C. CENTER - BUSINESS, SHOPPING & AMUSEMENT
- D. SQUARE
- E. SECTOR BELT - (SECONDARY SHOPPING CENTER , SCHOOLS, CLUBS, SPORTS.
- F. NEIGBOURHOOD CENTER - (MINIMUM SHOPPING CENTER, PRIMARY SCHOOL)

UNIT DIAGRAM

NC THE SOLUTION (UNITS)

(4)

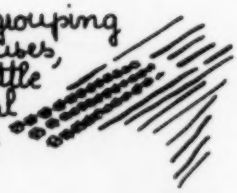


We began by establishing the radius. The chosen radius - 1200M - is the distance that can be walked in 15 minutes, without strain : in a short time, the farthest dweller reaches easily the center, without bothering with mechanical transport.

(6)

...And we distributed the population in individual houses (1 and 2 floors), in row houses (1 and 2 floors), and in buildings with 2, 3, 10 and 17 floors - taking care that the high buildings would not shade or overlook the lower ones.

We avoided the usual grouping of so called low-cost houses, the row upon row of little boxes without architectural substance, a depressing characteristic of city suburbia.



(5)

Once the area was fixed (TR^2), the densities were classified.

We wanted the population to be large enough to justify sizeable installations for work, culture, service and play;

We wanted all Units - each one a complete city - to have a robust social and artistic life. We did not want people to be crowded together - except by their own will, and in designed places.

<u>We wanted proximity without promiscuity.</u>

We realised that gross density should be more than 100 people per hectare, without reaching 150. To use round figures:

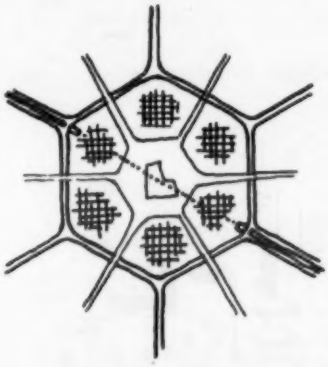
<u>142 inhab/ha</u>

(7)

In all the Units, the individual house must possess enough volume to show Architectural value. The small dwellings - unavoidable - will be re-united 3, 4, 20 etc... and will acquire a dignified status.

NC THE SOLUTION (UNITS)

(8)



The Core installations will characterise the Unit: in this one, Administration will be predominant, in that one, the technical bodies; in still another one, business or artistic life, etc...

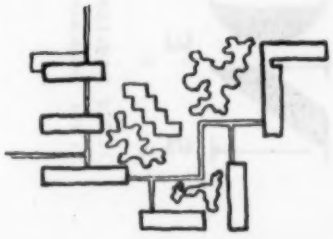
Buses and the Rapid Transit System, will cross the Unit (at levels carefully chosen), but will stop only at the Core, near the Town Square. But for the internal service of the Unit - as everything is so near, and the system of covered passageways connects all buildings - any vehicle transportation can be dispensed with. Nobody will use his private car, for anything except for pleasure or for reaching the Federal Park or another Unit. However, the motorcar, without interfering with the pedestrian ways, reaches to the door of every dwelling.

(9)

People will go around comfortably, walking on shaded sidewalks. To make travel easier, there will be moving sidewalks, under the covered ways.
The mechanical sidewalks, travelling in both directions, will be interrupted every 80 meters, to allow for crossing traffic and to make possible for people to enter them in front as they do in escalators.

NOTE :

The sport fields, the play-grounds, were placed in selected points.
The little ones, however, since the infant population is substantial have almost all the city to play. And they will play in front of their own house, without any risk of being run over.



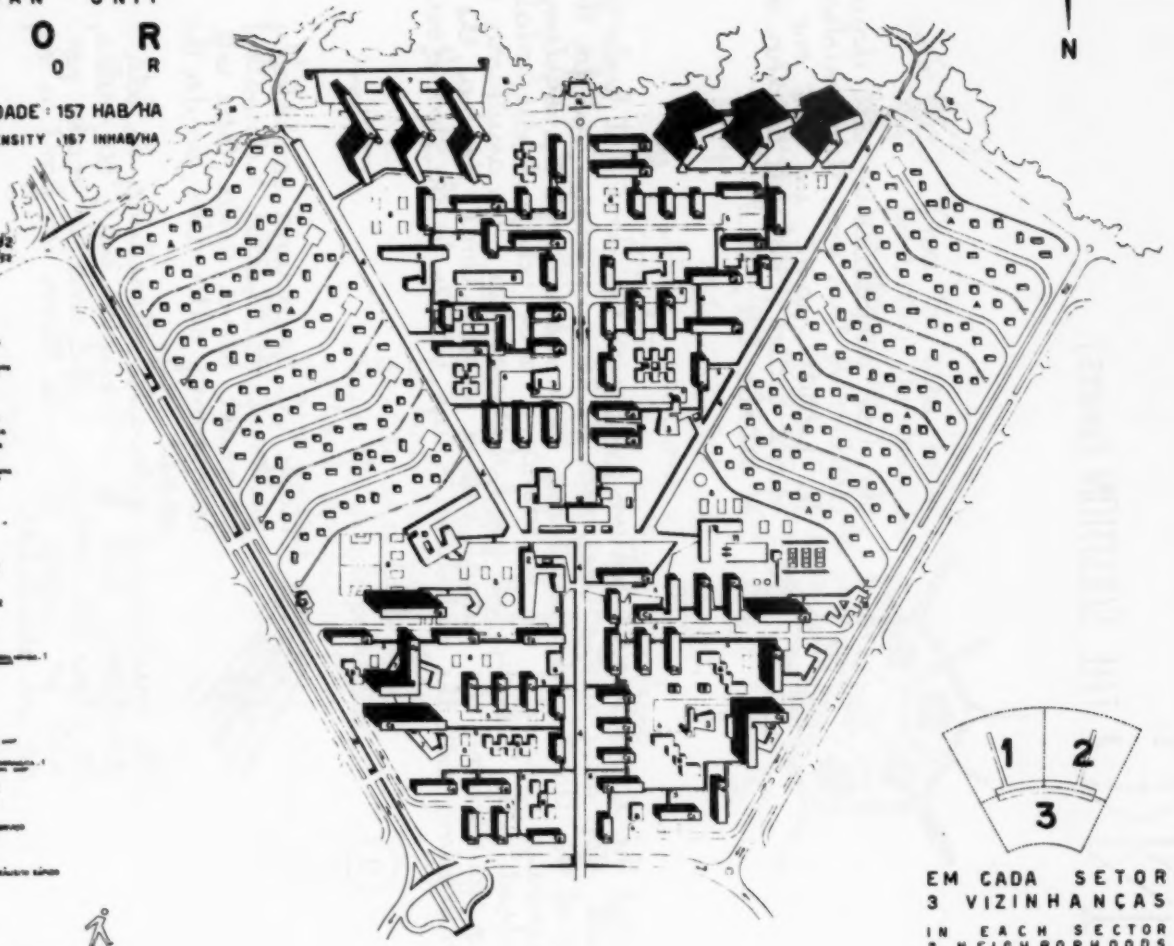
NC

UNIDADE URBANA
URBAN UNIT

S E T O R
S E C T O R

11.922 HABITANTES – DENSIDADE : 157 HAB/HA
11 922 INHABITANTS DENSITY : 157 INHAB/HA

TOTAL DE HABITAÇÕES POR VIZINHANÇA : 792
HABITATIONS PER NEIGHBORHOOD : 792



EM CADA SETOR
3 VIZINHANÇAS
IN EACH SECTOR
3 NEIGHBORHOODS

Roberto, M.M. Alternative plan for new capital city of Brazil.

1. Single Houses
2. Apartments
3. Neighborhood Center
4. Primary school
5. Church
6. Sector Center
7. Club
8. Secondary School
9. Covered way and conveyor
10. Gas Station
11. Covered way
12. Auto Repair Shop and Gas Station
13. Play Fields and Play-Ground
14. Administration, Professions, Culture, Assistance, Services
15. Shopping and Amusement
16. Unit Square
17. Parking
18. Rapid Transit Line
19. Park and Woods.

NC

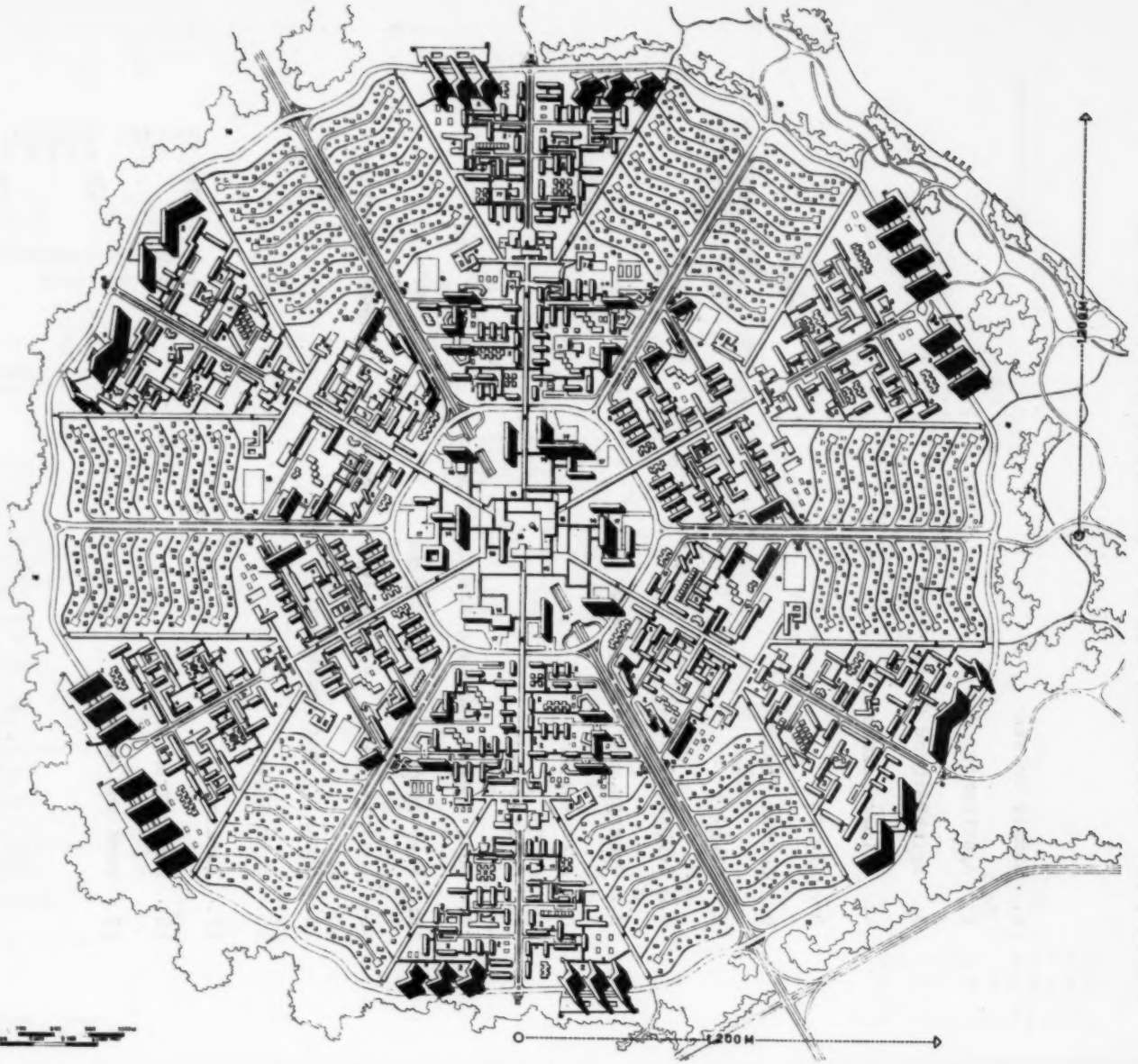
UNIDADE URBANA

U R B A N
U N I T

POPULAÇÃO: 72.000 HAB.
POPULATION: 72.000 INHAB.

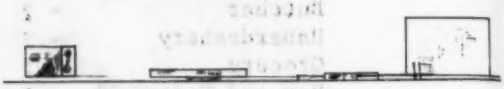
DENSIDADE: 142 HAB/HA.
DENSITY: 142 INHAB/HA.

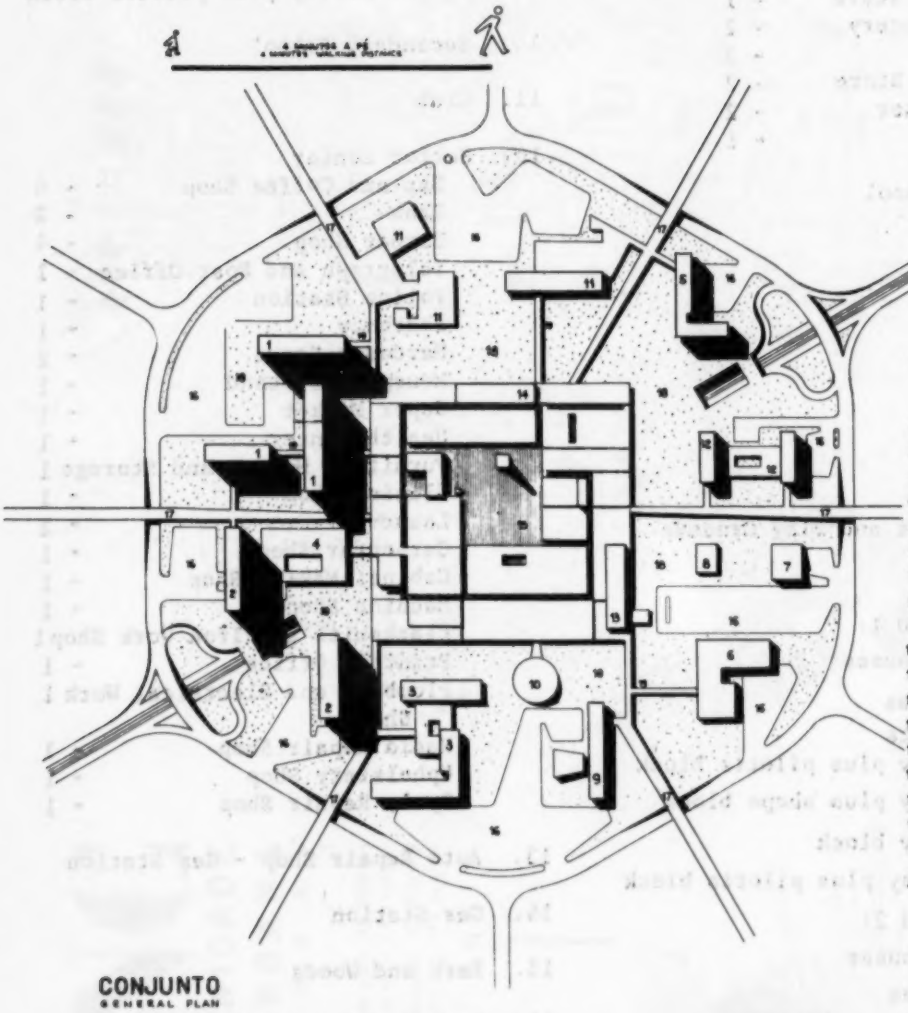
N



Roberto, M.M. Alternative plan for new capital city of Brazil.

1. Neighborhood Center
   - Butcher - 2
   - Haberdashery - 2
   - Grocery - 2
   - Bar and Coffee Shop - 2
   - Library - 1
   - Barber Shop - 2
   - Beauty Parlor - 2
   - Tea Room - 1
   - Pharmacy - 2
   - Newspapers Stand - 2
   - Dairy - 2
   - Bakery - 2
   - Sea Food Store - 1
   - Green Grocery - 2
   - Cobbler - 2
   - Hardware Store - 2
   - Dry Cleaner - 2
   - Florist - 1
2. Primary School
3. Church
4. Conveyor
5. Covered way
6. Parking
7. Garage
8. Sport Fields and Play Grounds
9. Dwellings
   - -Neighborhood 1:
     - A- Single Houses
     - B- Row Houses
     - C- Apartments
     - C_2- 2 Storey plus pilotis block
     - C_3- 2 Storey plus shops block
     - C_4- 3 Storey block
     - C_5- 10 Storey plus pilotis block
   - -Neighborhood 2:
     - A- Single Houses
     - B- Row Houses
     - C- Apartments
     - C_1- 1 Storey plus pilotis block
     - C_2- 2 Storey plus pilotis block
     - C_3- 2 Storey plus shops block
     - C_4- 3 Storey block
     - C_5- 17 Storey plus pilotis block
   - -Neighborhood 3:
     - A- Row Houses
     - C- Apartments
     - C_1- 1 Storey plus pilotis block
     - C_2- 2 Storey plus pilotis block
     - C_3- 2 Storey plus shops block
     - C_4- 3 Storey block
     - C_5- 10 Storey plus pilotis block
10. Secondary School
11. Club
12. Sector Center
    - Bar and Coffee Shop - 4
    - Bank - 2
    - Barber Shop - 4
    - Telegraph and Post Office - 1
    - Police Station - 1
    - Pharmacy - 1
    - Hardware Store - 2
    - Newspapers Stand - 1
    - Super Market - 1
    - Health Center - 1
    - Furniture Moving and Storage 1
    - Glazier Shop - 1
    - Laundry - 2
    - Carpenter Shop - 1
    - Cabinet Making Shop - 1
    - Machine Shop - 1
    - Blacksmith and Iron Work Shop 1
    - Printing Office - 1
    - Plumbing and Electrical Work Shop 1
    - Radio Repair Shop - 1
    - Upholstery Shop - 1
    - Cycle Repair Shop - 1
13. Auto Repair Shop - Gas Station
14. Gas Station
15. Park and Woods
16. Rapid Transit Line




N
1. DEPTOS E SERVIÇOS NACIONAIS DA VIAÇÃO
FEDERAL TRANSPORTATION AND COMMUNICATION DEPARTMENTS
2. DEPTOS E SERVIÇOS NACIONAIS DE OBRAS E SANEAMENTO
FEDERAL PUBLIC WORKS DEPARTMENTS
3. ESCOLAS DE CIÊNCIAS APLICADAS DA UNIVERSIDADE FEDERAL
FEDERAL UNIVERSITY APPLIED SCIENCE SCHOOLS
4. DEPTOS DOS CORREIOS E TELÉGRAFOS
NATIONAL TELEGRAPH AND POST OFFICE DEPARTMENT
5. HOSPITAL DA LAVRADE
MUNICIPAL HOSPITAL
6. GARAGE E OFICINA DOS TRANSPORTES MUNICIPAIS
MUNICIPAL TRANSPORT GARAGE AND REPAIR SHOPS
7. CORPO DE BOMBEIROS
FIRE - HOUSE
8. SUB ESTAÇÃO DE ENERGIA ELÉTRICA
ELECTRIC POWER SUB-STATION
9. ESCOLAS DE CIÊNCIAS APLICADAS DA UNIVERSIDADE CATÓ
CATHOLIC UNIVERSITY APPLIED SCIENCE SCHOOLS
10. MUSEU TÉCHICO
TECHNICAL MUSEUM
11. CLUBES E ASSOCIAÇÕES TÉCNICAS E PROFISSIONAIS
TECHNICAL AND PROFESSIONAL ASSOCIATIONS
12. CONSELHO MUNICIPAL E FORUM
TOWN HALL AND FORUM
13. HOTEL - 100 QUARTOS
HOTEL - 100 ROOMS
14. ESCRITÓRIOS - COMERCIAIS, PROFISSIONAIS
OFFICES - BUSINESS, PROFESSIONAL
15. PRAÇA
TOWN SQUARE
16. ESTACIONAMENTO
PARKING
17. COBERTURA DA CALÇADA MECÂNICA
CONVEYOR RAMP
18. PARQUE
PARK
19. PASSAGEM COBERTA
COVERED WAYS

CONJUNTO
GENERAL PLAN

NC

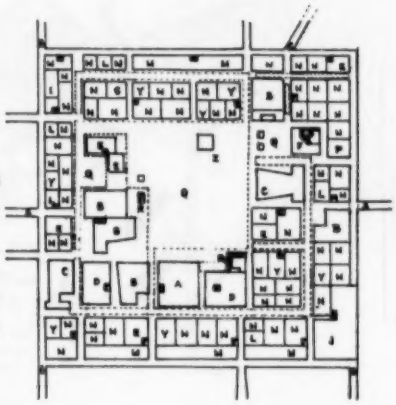
COMUNICAÇÕES
COMMUNICATIONS

UU2 _ C O R E

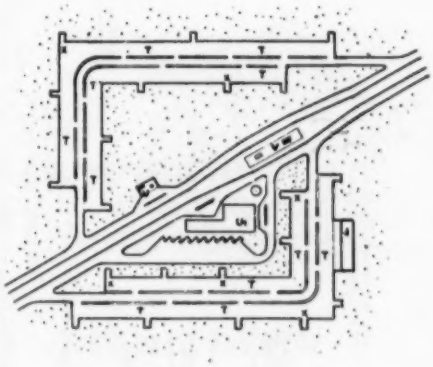
FUNCIONÁRIOS FEDERAIS
FEDERAL EMPLOYEES — 8.490..... — 126.000,00M2

SERVIÇOS GERAIS
PRIVATE BUSINESS AND EMPLOYEES — 3.993..... — 62.870,00M2

A_ CENTRO CULTURAL: MUSEU, BIBLIOTECA, GALERIAS DE ARTE
CULTURAL CENTER: MUSEUM, LIBRARY, ART GALLERIES
B_ CASAS DE ESPETÁCULO
THEATERS OR CINEMAS
C_ IGREJA
CHURCH
D_ LOJAS DE DEPARTAMENTOS
DEPARTMENT STORES
E_ RESTAURANTE E CONFEITARIA
RESTAURANT AND TEA-ROOM
F_ ESTAÇÃO DO "MONORAIL"
MONORAIL STATION
G_ CENTRAL TELEFÔNICA
TELEPHONE COMPANY
H_ CORREIOS E TELÉGRAFOS
TELEGRAPH AND POST OFFICE
I_ POLÍCIA
POLICE STATION
J_ HOTEL
HOTEL
L_ AGÊNCIAS DOS INSTITUTOS
WELFARE LOCAL OFFICES
M_ ESCRITÓRIOS
OFFICES
N_ LOJAS
SHOPS
P_ CRECHE
NURSERY
Q_ PRAÇA
SQUARE
R_ ACESSO PARADA ÔNIBUS
BUS STOP ACCESS
R1_ ACESSO TERMINAL ÔNIBUS
BUS TERMINAL ACCESS
S_ CALÇADA MECÂNICA
CONVEYOR
T_ ESTACIONAM. E DESCARGA
PARKING AND UNLOADING
U_ PARADA DE ÔNIBUS
BUS STOP
U1_ TERMINAL DE ÔNIBUS
BUS TERMINAL
V_ PLATAFORMA "MONORAIL"
MONORAIL PLATFORM
X_ ACESSO DAS LOJAS
SHOPS ACCESS
Y_ BANCO
BANK
Z_ OBELISCO
OBELISK



COMPRAS E DIVERSÕES
SHOPPING AND AMUSEMENT



SUBSOLO
BASEMENT

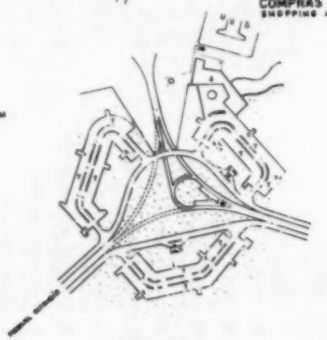
NC PRODUÇÃO
AGRICULTURE & INDUSTRY

UU7 _ C O R E

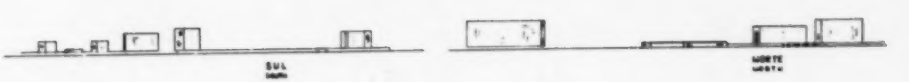
7.290 ..... 108.000,00M2

4.458 ..... 69.840,00M2

COMPRAS E DIVERSÕES
SHOPPING AND AMUSEMENT



SUBSOLO
BASEMENT

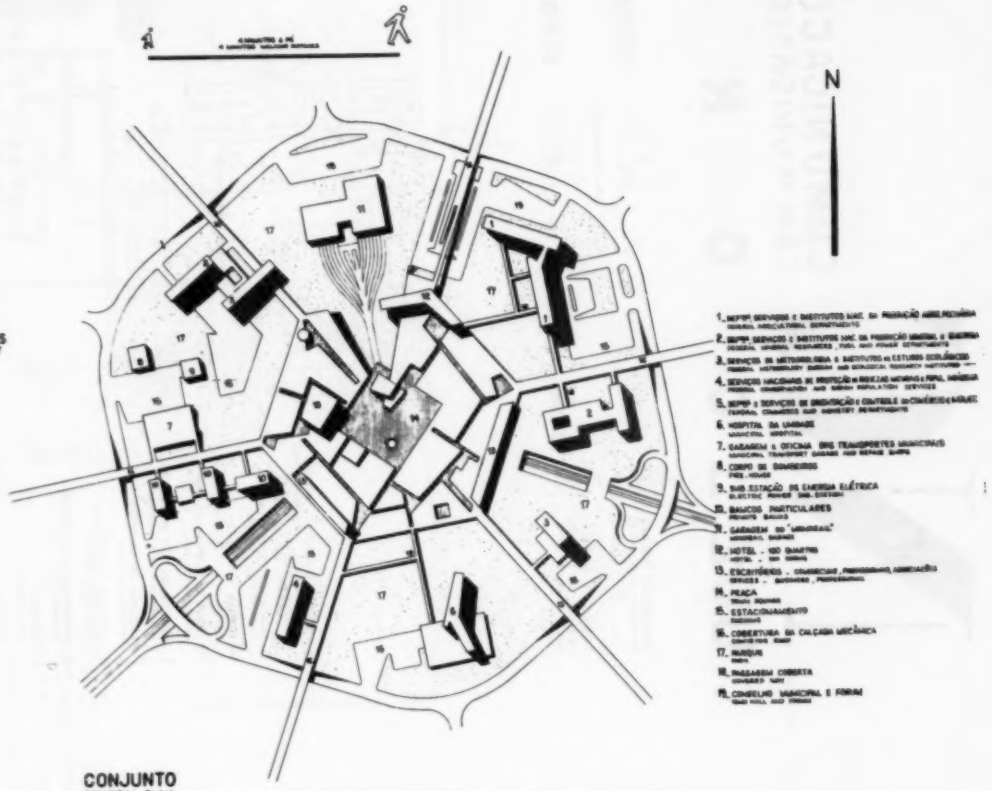


SUL
SOUTH

NORTE
NORTH

OESTE
WEST

LESTE
EAST



N

CONJUNTO
GENERAL PLAN

NC

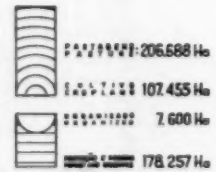
DETERMINAÇÃO DA CAPACIDADE DE ABASTECIMENTO
FOOD PRODUCTION CAPACITY

REFEIÇÃO DIÁRIA DE 1 FAMÍLIA (5 PESSOAS)
MÉDIA ANUAL

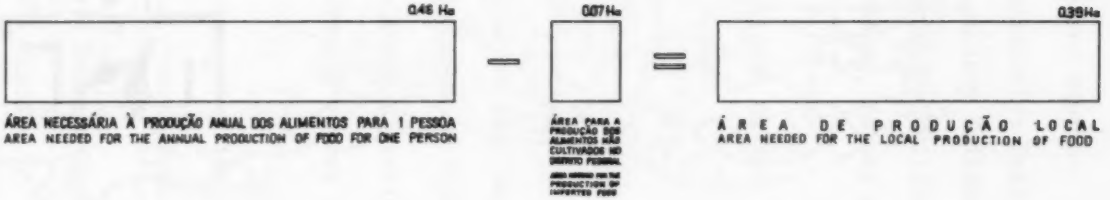
DAILY FOOD CONSUMPTION FOR ONE FAMILY (5 PERSONS)
ANNUAL AVERAGE

	400	800
	180	450
	25	20
	50	50
	1600	1.600
	100	160
	400	1.600
	500	2.000
	550	2.200
	250	500
	200	800
	600	600
	500	300
	750	370
	130	1.170
	450	1.930
	14	120
	110	
	27	
	6.846	14.670

MÉDIA POR PESSOA: 2934 CALORIAS POR DIA
AVERAGE: 2934 CALORIES PER DAY PER PERSON



500.000 Ha

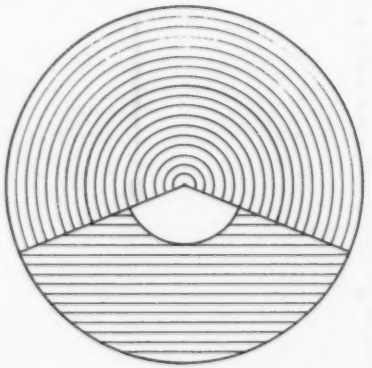


ÁREA NECESSÁRIA À PRODUÇÃO ANUAL DOS ALIMENTOS PARA 1 PESSOA
AREA NEEDED FOR THE ANNUAL PRODUCTION OF FOOD FOR ONE PERSON

ÁREA PARA A PRODUÇÃO DOS ALIMENTOS NÃO CULTIVADOS NO DISTRITO FEDERAL
AREA NEEDED FOR THE PRODUCTION OF IMPORTED FOOD

ÁREA DE PRODUÇÃO LOCAL
AREA NEEDED FOR THE LOCAL PRODUCTION OF FOOD

CONDIÇÕES DE APROVEITAMENTO DO SOLO DA REGIÃO DO PLANO
LAND USE IN THE FEDERAL DISTRICT AREA



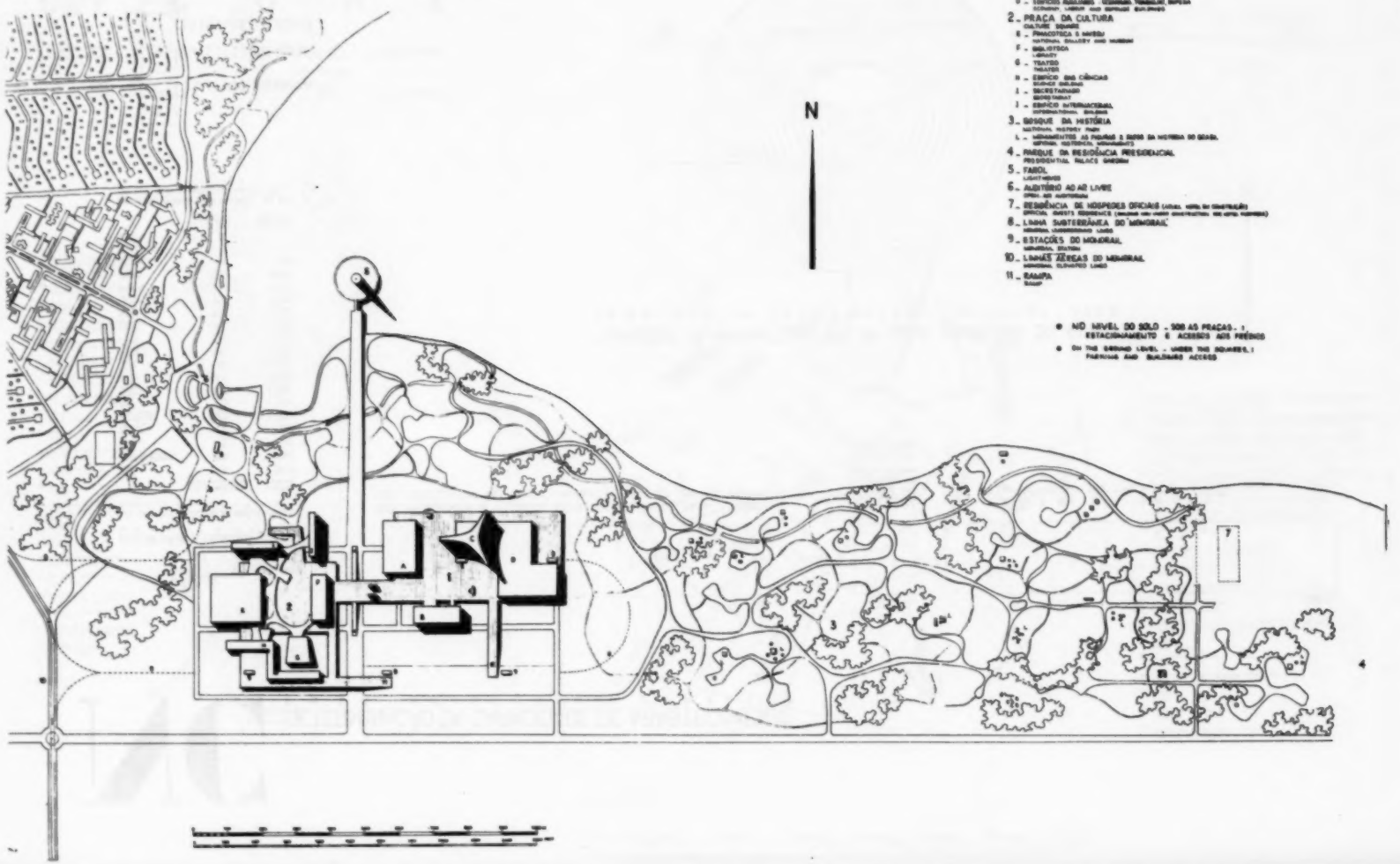
$$\frac{\text{CULTIVO + PASTO}}{\text{PRODUÇÃO LOCAL / PESSOA}} = 805.494 \text{ HABITANTES}$$

CROPLAND + PASTURE
LOCAL PRODUCTION OF FOOD / PERSON

POPULAÇÃO MÁXIMA ADMISSÍVEL
MAXIMUM PERMISSIBLE POPULATION

NC

PARQUE FEDERAL
FEDERAL PARK


N
1. PRAÇA DOS TRÊS PODERES
A - LEGISLATIVO
B - JUDICIÁRIO
C - EXECUTIVO
D - EDIFÍCIOS ANEXOS
2. PRAÇA DA CULTURA
E - PINACOTECA E MUSEU
F - BIBLIOTECA
G - TEATRO
H - EDIFÍCIO DAS CIÊNCIAS
I - SECRETARIADO
J - EDIFÍCIO INTERNACIONAL
3. BOSQUE DA HISTÓRIA
L - MONUMENTOS AS FIGURAS E FATOS DA HISTÓRIA DO BRASIL
4. PARQUE DA RESIDÊNCIA PRESIDENCIAL
5. FAROL
6. AUDITÓRIO AO AR LIVRE
7. RESIDÊNCIA DE HÓSPEDES OFICIAIS
8. LINHA SUBTERRÂNEA DO 'MONORAIL'
9. ESTAÇÕES DO MONORAIL
10. LINHAS AÉREAS DO MONORAIL
11. RAMPA
• NO NÍVEL DO SOLO - PRAÇAS - ESTACIONAMENTO E ACESSOS AOS PRÉDIOS
• ON THE GROUND LEVEL - UNDER THE SQUARES - PARKING AND BUILDINGS ACCESS

Roberto, M.M. Alternative plan for new capital city of Brazil.

1 - Government Square

A. Legislative Building

B. Judiciary Building

C. Executive Building

D. Economy, Labour and Defense Buildings

2 - Culture Square

E. National Gallery and Museum

F. Library

G. Theater

H. Science Building

I. Secretariat

J. International Building

3 - National History Park

L. National Historical Monuments

4 - Presidential Palace Garden

5 - Lighthouse

6 - Open Air Auditorium

7 - Official Guests Residence (Building now under construction for hotel purposes)

8 - Monorail Underground Lines

9 - Monorail Station

10 - Monorail Elevated Lines

11 - Ramp.

--On the ground level - under the squares: Parking and buildings access.

NC ESTABELECIMENTOS AGRÍCOLAS
AGRICULTURAL ESTABLISHMENTS

TIPO TYPE	ÁREA	QUANTIDADE NUMBER	FAMÍLIAS POR ESTABELECIMENTO FAMILIES PER ESTABLISHMENT	TOTAL DE FAMÍLIAS TOTAL OF FAMILIES	ATIVIDADES PREVAILING ACTIVITIES
A		1000		2000	70% DE FRUTICULTURA E 30% DE HORTICULTURA 70% ORCHARDS AND 30% TRUCK-CROPS
B		1400		2800	90% DE ARROZ E 10% DE HORTICULTURA 90% RICE AND 10% TRUCK-CROPS
C		5770		5770	1/3 DE MILHO E FEIJÃO E 2/3 DE GADO LEITEIRO, GADO DE CORTE, PORCOS, CARNEIROS E GALINHAS 1/3 CORN & BEANS AND 2/3 DAIRY CATTLE, BEEF CATTLE, PIGS, SHEEPS AND CHICKENS
D		856		856	1/3 DE TRIGO E MILHO E 2/3 DE GADO LEITEIRO, GADO DE CORTE, PORCOS, CARNEIROS E GALINHAS 1/3 WHEAT & CORN AND 2/3 DAIRY CATTLE, BEEF CATTLE, PIGS, SHEEPS AND CHICKENS
E		6678		6678	1/3 DE TRIGO, MILHO, BATATA E MANDIOCA E 2/3 DE GADO LEITEIRO, GADO DE CORTE, PORCOS, CARNEIROS E GALINHAS 1/3 WHEAT, POTATOES, MANIOC AND 2/3 DAIRY CATTLE, BEEF CATTLE, PIGS, SHEEPS AND CHICKENS
F		14		14	GADO DE CORTE BEEF CATTLE
G		654		654	GADO DE CORTE BEEF CATTLE
H		80		80	60% DE BATATA E 40% DE MANDIOCA 60% POTATOES AND 40% MANIOC
TOTAIS TOTALS		16452		18852	

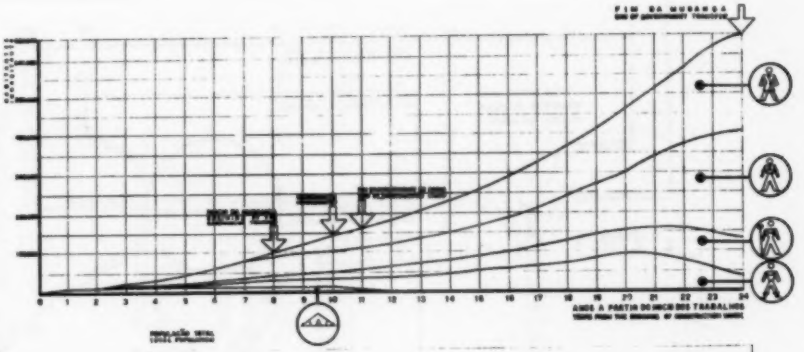
CA 35 80

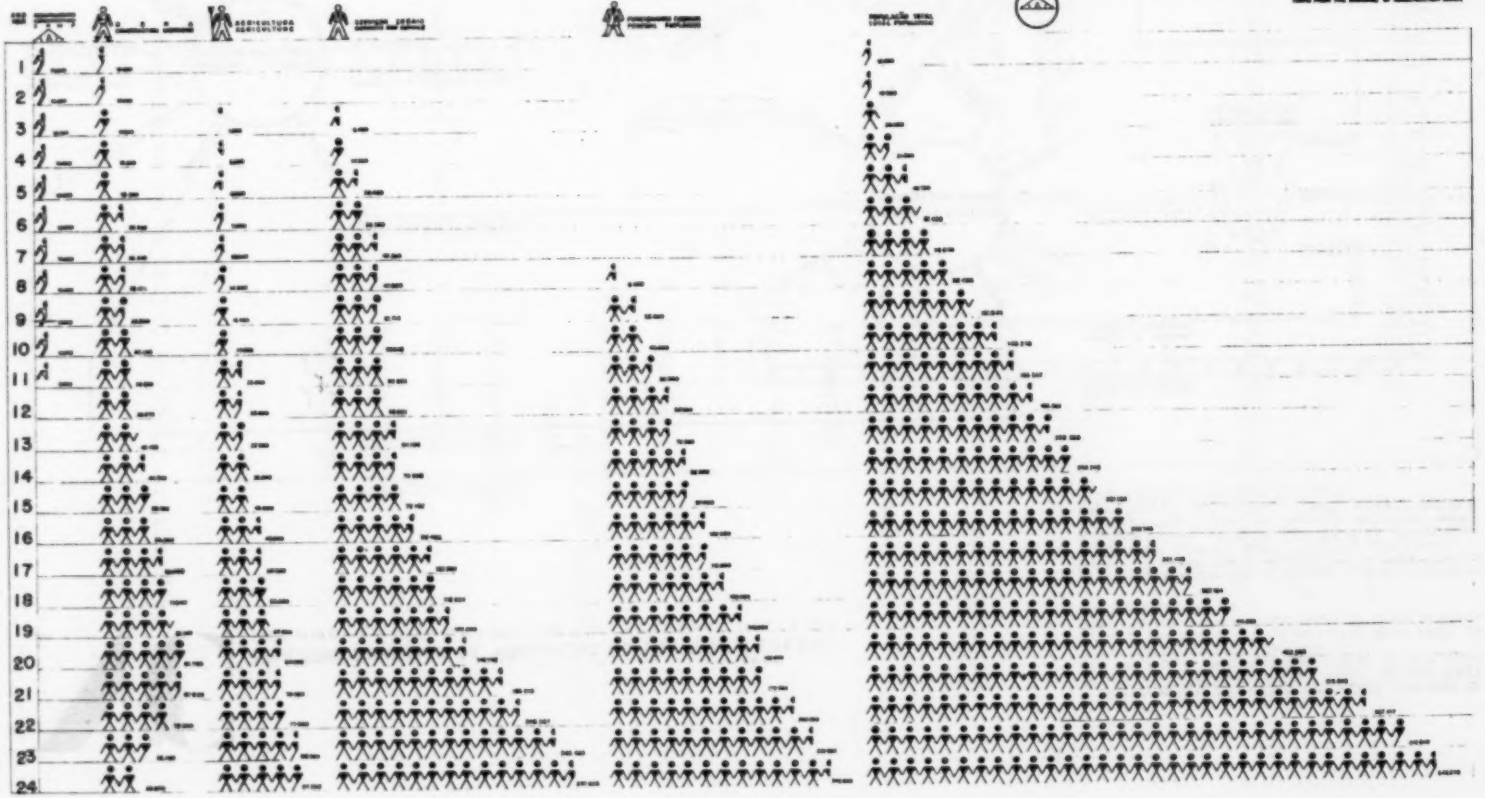
NC

FORMAÇÃO DA CAPITAL E DA AREA DO DISTRITO FEDERAL
DEVELOPMENT OF THE CAPITAL AND FEDERAL DISTRICT

CRESCIMENTO PREVISTO PARA A POPULAÇÃO - POPULATION GROWTH
HIPOTESE DE CRESCIMENTO NORMAL - NORMAL GROWTH HYPOTHESIS

=20.000



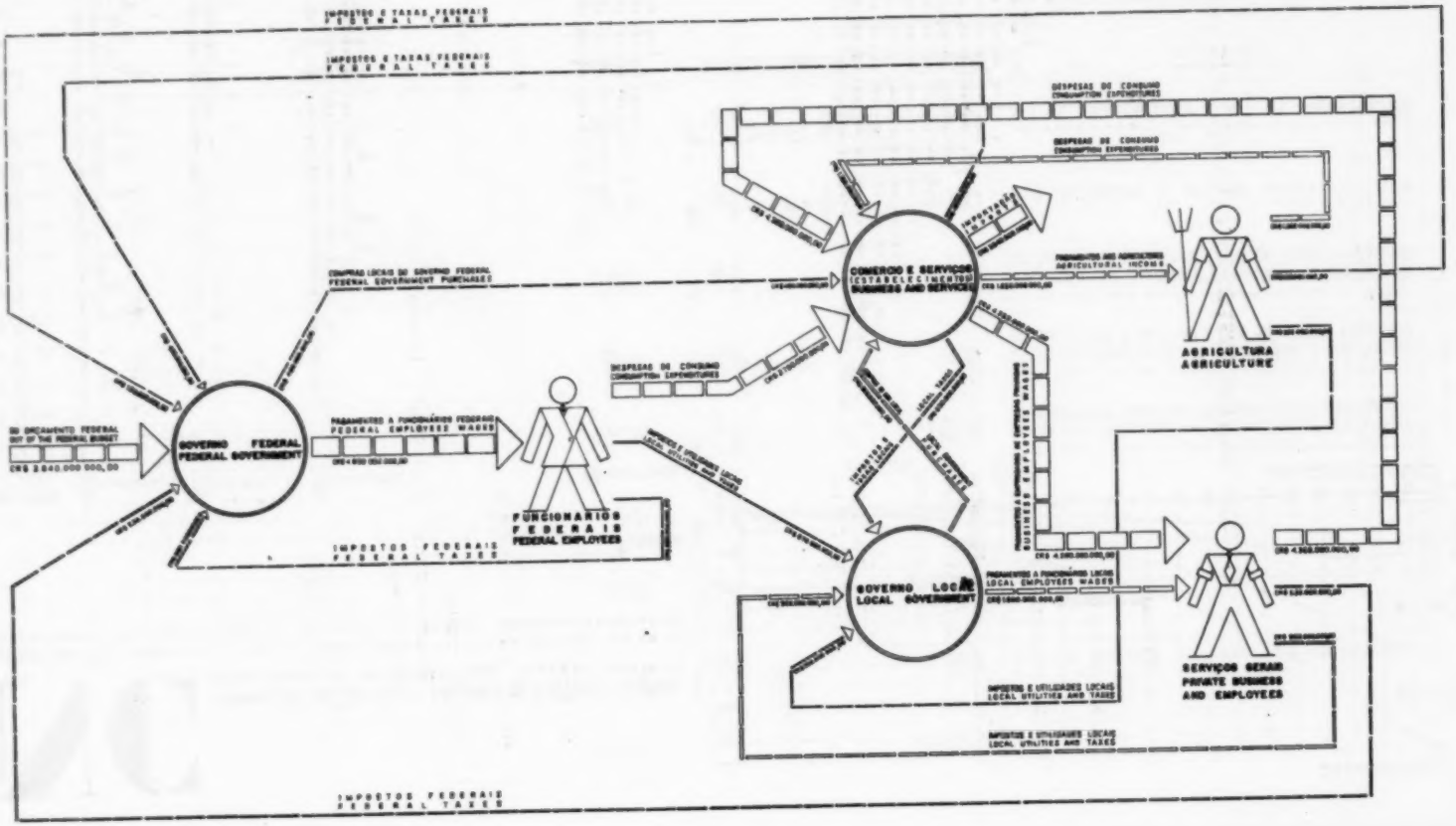


NC

EQUILIBRIO ECONOMICO DA POPULAÇÃO DO DISTRITO FEDERAL
INCOME DISTRIBUTION IN THE FEDERAL DISTRICT

O GRÁFICO MOSTRA, DE MANEIRA SIMPLIFICADA, COMO TODOS OS GRUPOS ECONOMICOS DA COLETIVIDADE PODEM TER UMA RENDA EQUILIBRADA SE AS SUAS PROPORÇÕES DENTRO DA POPULAÇÃO FOREM CORRETAMENTE DETERMINADAS.
TOMOU-SE PARA BASE DE CÁLCULO UM SALÁRIO MÉDIO ANUAL DE 60.000 CRUZEIROS E UMA IMPORTAÇÃO MEDIA DE 30.000 CRUZEIROS POR ANO E POR FAMÍLIA.

EQUILIBRIUM OF INCOMES FOR THE POPULATION, SHOWN IN SIMPLIFIED FORM IN THE DIAGRAM, CAN BE MAINTAINED IF THE PROPORTIONS OF THE DIFFERENT ECONOMIC GROUPS IS CORRECTLY ESTABLISHED.
AN AVERAGE YEARLY INCOME OF 60.000 CRUZEIROS PER GAINFULLY EMPLOYED PERSON WAS USED AS A BASIS FOR THE DIAGRAM. IMPORTS FROM OUTSIDE THE FEDERAL DISTRICT WERE ESTIMATED AT 30.000 CRUZEIROS PER YEAR PER FAMILY.



E K I S T I C S

HOUSING & PLANNING ABSTRACTS

CLASSIFICATION SYSTEM USED BY DOXIADIS ASSOCIATES

A The Problems

B The Policies

C The Programs

D People, Development, and Ekistics**
- Geographic factors
- Social factors
- Industry
- Agriculture
- Transportation

E Houses

F Structures (exclusive of Houses)

G Community services
- Utilities and Social Services

H Regions

I Major urban centers

J Market towns
- Medium-sized and small towns
- New towns

K Villages
- Rural land

L Farms

M Surveys
- Census data
- Topographical surveys

N Research (and Technical Education)

O Planning (and Landscaping)

P Financing

Q Urban land

R Labor

S Materials

T Construction
- Systems of Building and Costs

U Implementation

V Management

W Administration

X Legislation

**Refers to centers of activities in relation to their surrounding regions.